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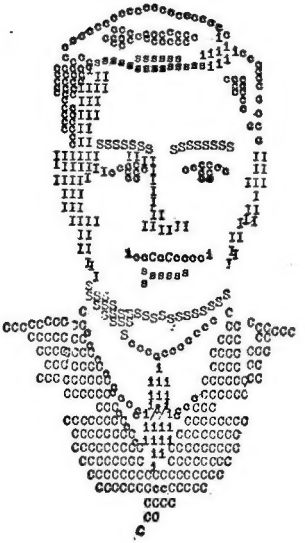

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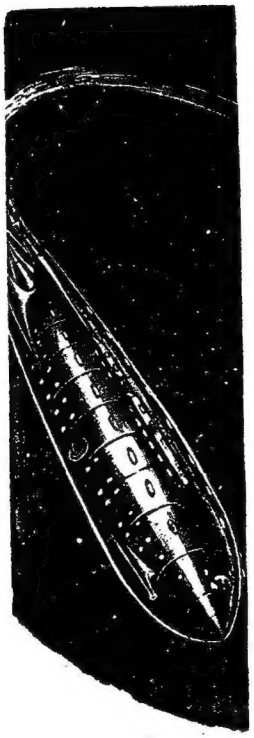

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SCIENCE FICTION

Reg. U. S. Pat. Off

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NEXT ISSUE ON SALE APRIL 20, 1948

STUNTED SEEDLING

Dr. Vincent Schaeffer of the General Electric Schenectady laboratories has, for many years, had a hobby—studying the crsytalline shapes of snowflakes, and the infinite varieties they form in their basically simple patterns. Like most successful professional scientists, his hobby and his professional work have a tendency to overlap and key into each other.

More recently, Dr. Schaeffer finally succeeded in doing something that no man before—despite innumerable attempts—had ever accomplished. Half a century ago, Moisson finally showed he could duplicate nature's crystalline carbon, diamonds, but until 1946, no one had produced true snowflake water crystals! I had a chance to watch the beautifully simple apparatus Dr. Schaeffer used, and play with it a bit myself; it's as beautiful in itself as the natural phenomenon, and, necessarily, quite like it. The stage is a night-black well, with a single strong light source casting a brilliant beam across. An exhaled breath fills the well—about two feet cube—with a billowing cloud of gray-white moisture. The cloud seems white, until a tiny bit of solid carbon dioxide is passed through it. Then the grayish cloud begins to boil and writhe; it sucks in on itself, and its true grayness shows up as brilliantly white, beautifully sparkling miniature snowflakes begin to settle down. Each tiny flake sparkles in the strong beam of light—and eats fog on its way down. You can blow fresh supplies of fog into it almost indefinitely, and still the tiny snowflakes magically eat and destroy that gray cloud.

The apparatus actually is simply a standard deep-freeze type frozen storage box, its inside lined with black velvet supported about an inch away from the freezer coils on all sides. Inside the space, the temperature is about 20° below zero Farenheit. The vapor of your breath condenses to super-cooled water droplets. The bitter—110° cold of the solid CO_2 starts the crystallization of the sub-freezing, but unfrozen, water—and after that seed crystal is sown, it grows swiftly at the expense of surrounding unfrozen droplets. Even at -20 or -50 water has a vapor pressure; at that temperature liquid water is the unstable form, solid is the stable form—so the snow crystals can grow at the expense of the droplets even without contact.

The seedling crystals Dr. Schaeffer sowed in his freezer box grew in an early experiment to the precipitation of a real snowfall when a natural, full-scale cloud was seeded with solid CO_2—and it worked. Since then, of course, the seedling has grown many fold.

But now the seedling is stunted. The day after Christmas, the northeastern United States started getting snow; in New York City, something more than two feet of snow fell. Now two feet of snow isn't a very unusual problem to Chicago, Bangor, Maine, or Fairbanks, Alaska; those cities expect it, and are geared to handle it. New York City isn't. It paralyzed the city for a couple

of days, seriously disrupted transportation, and resulted in homes without heat when fuel trucks couldn't get through snow-clogged streets. Removal alone cost the city roughly $6,000,000.

Fortunately, no one, anywhere remotely in the region had been experimenting with seeded snow clouds at any time within weeks. If General Electric had been so unfortunate as to have a research project seeding snow clouds even two hundred and fifty miles out in the Atlantic at that time, somebody would have been sure to slap a suit on them. If they had made an effort—as has been proposed—to dump the snow clouds before they hit New York, consider the probable results.

If snow clouds could be dumped over New York City's reservoir system, so that the snow was turned into drinking water for the city, it would normally be fine indeed. That would save the city money, and yield always-welcome water revenue. But in this case, one of two things might have happened. First, if all the snow had been dumped there, the abnormal—and stupendous!—tonnage of water might have caused a major washout when it thawed in the spring. Then Lord help the people responsible for dumping all that snow there!

Again, suppose it had been partially successful—giving a lot of snow to the reservoirs, but letting 4/5ths of the snow pass on to the city. That would mean some twenty inches of snow in New York—and no one can guess how many hundreds of millions in suits against the cloud-seeders. A half-hour with weather records would show that New York City never gets any such snowfall naturally; obviously a twenty-inch snow that crippled New York would be entirely the fault of those cloud-seeders. Why, even the historic three-day blizzard of '88 deposited only 16.5 inches in twenty-four hours. The heaviest twenty-four-hour snowfall on record previously was only 17.5 inches, back in 1893. Furthermore, the Weather Bureau's public forecast showed they expected only about five inches—though they had told police and sanitation departments there was one chance in four of a very heavy snow.

With all this evidence, it would be a dead cinch to prove cloud-seeders responsible for that paralyzing snowfall, if any had been operating anywhere in the remote neighborhood! With a loss of hundreds of millions to New York metropolitan area businesses, nobody could stand the resultant law suits—and no government could survive the outraged screams of "You did this to us!"

So—we've got the first entering wedge on weather control—a method that depends on triggering great natural forces, the only method tiny man can hope to apply. But this promising seedling is very apt to be stunted permanently, as are all other weather-control projectors. Let's amend the old saying:

"Everybody talks about the weather, but nobody *dares* do anything about it!"

THE EDITOR.

* * * * * * * * * *

EX MACHINA

BY LEWIS PADGETT

***Gallegher**, the Mad Scientist who plays by ear is loose! Worse—from Gallegher's viewpoint—a "small brown animal" he couldn't see kept him in a horrid state of sobriety by drinking all his liquor!*

Illustrated by Cartier

"I got the idea out of a bottle labeled 'DRINK ME'," Gallegher said wanly. "I'm no technician, except when I'm drunk. I don't know the difference between an electron and an electrode, except that one's invisible. At least I do know, sometimes, but they get mixed up. My trouble is semantics."

"Your trouble is you're a lush," said the transparent robot, crossing its legs with a faint crash. Gallegher winced.

"Not at all. I get along fine when I'm drinking. It's only during my periods of sobriety that I get confused. I have a technological hangover. The aqueous humor in my eyeballs is coming out by osmosis. Does that make sense?"

"No," said the robot, whose name was Joe. "You're crying, that's all. Did you turn me on just to have an audience? I'm busy at the moment."

"Busy with what?"

"I'm analyzing philosophy, *per se*. Hideous as you humans are, you sometimes get bright ideas. The clear, intellectual logic of pure philosophy is a revelation to me."

Gallegher said something about a hard, gemlike flame. He still wept sporadically, which reminded him of the bottle labeled "DRINK ME," which reminded him of the liquor

organ beside the couch. Gallegher stiffly moved his long body across the laboratory, detouring around three bulky objects which might have been the dynamos, Monstro and Bubbles, except for the fact that there were three of them. This realization flickered only dimly through Gallegher's mind. Since one of the dynamos was looking at him, he hurriedly averted his gaze, sank down on the couch, and manipulated several buttons. When no liquor flowed through the tube into his parched mouth, he removed the mouthpiece, blinked at it hopelessly, and ordered Joe to bring beer.

The glass was brimming as he raised it to his lips. But it was empty before he drank.

"That's very strange," Gallegher said. "I feel like Tantalus."

"Somebody's drinking your beer," Joe explained. "Now do leave me alone. I've an idea I'll be able to appreciate my baroque beauty even more after I've mastered the essentials of philosophy."

"No doubt," Gallegher said. "Come away from that mirror. Who's drinking my beer? A little green man?"

"A little brown animal," Joe explained cryptically, and turned to the mirror again, leaving Gallegher to glare at him hatefully. There were times when Mr. Galloway Gallegher yearned to bind Joe securely under a steady drip of hydrochloric. Instead, he tried another beer, with equal ill luck.

In a sudden fury, Gallegher rose and procured soda water. The little brown animal had even less taste for such fluids than Gallegher himself; at any rate, the water didn't mysteriously vanish. Less thirsty but more confused than ever, Gallegher circled the third dynamo with the bright blue eyes and morosely examined the equipment littering his workbench. There were bottles filled with ambiguous liquids, obviously nonalcoholic, but the labels meant little or nothing. Gallegher's subconscious self, liberated by liquor last night, had marked them for easy reference. Since Gallegher Plus, though a top-flight technician, saw the world through thoroughly distorted lenses, the labels were not helpful. One said "RABBITS ONLY." Another inquired "WHY NOT?" A third said "CHRISTMAS NIGHT."

There was also a complicated affair of wheels, gears, tubes, sprockets and light tubes plugged into an electric outlet.

"Cogito, ergo sum," Joe murmured softly. "When there's no one around on the quad. No. Hm-m-m."

"What about this little brown animal?" Gallegher wanted to know. "Is it real or merely a figment?"

"What is reality?" Joe inquired, thus confusing the issue still further. "I haven't resolved that yet to my own satisfaction."

"Your satisfaction!" Gallegher said. "I wake up with a tenth-power hangover and can't get a drink. You tell me fairy stories about little brown animals stealing my liquor. Then you quote moldy philosophical concepts at me. If I

pick up that crowbar over there, you'll neither be *nor* think in very short order."

Joe gave ground gracefully. "It's a small creature that moves remarkably fast. So fast it can't be seen."

"How come you see it?"

"I don't. I varish it," said Joe, who had more than the five senses normal to humans.

"Where is it now?"

"It went out a while ago."

"Well—" Gallegher sought inconclusively for words. "Something must have happened last night."

"Naturally," Joe agreed. "But you turned me off after the ugly man with the ears came in."

"I remember that. You were beating your plastic gums . . . *what* man?"

"The ugly one. You told your grandfather to take a walk, too, but you couldn't pry him loose from his bottle."

"Grandpa. Uh. Oh. Where's he?"

"Maybe he went back to Maine," Joe suggested. "He kept threatening to do that."

"He never leaves till he's drunk out the cellar," Gallegher said. He tuned in the audio system and called every room in the house. There was no response. Presently Gallegher got up and made a search. There was no trace of Grandpa.

He came back to the laboratory, trying to ignore the third dynamo with the big blue eyes, and hopelessly studied the workbench again. Joe, posturing before the mirror, said he thought he believed in the basic philosophy of intellectualism. Still, he added, since obviously Gallegher's intellect was in abeyance. it might pay to hook up the projector and find out what had happened last night.

This made sense. Some time before, realizing that Gallegher sober never remembered the adventures of Gallegher tight, he had installed a visio-audio gadget in the laboratory, cleverly adjusted to turn itself on whenever circumstances warranted it. How the thing worked Gallegher wasn't quite sure any more, except that it could run off miraculous blood-alcohol tests on its creator and start recording when the percentage was sufficiently high. At the moment the machine was shrouded in a blanket. Gallegher whipped this off, wheeled over a screen, and watched and listened to what had happened last night.

Joe stood in a corner, turned off, probably cogitating. Grandpa, a wizened little man with a brown face like a bad-tempered nutcracker, sat on a stool cuddling a bottle. Gallegher was removing the liquor-organ mouthpiece from between his lips, having just taken on enough of a load to start the recorder working.

A slim, middle-aged man with large ears and an eager expression jittered on the edge o his relaxer, watching Gallegher.

"Claptrap," Grandpa said in a squeaky voice. "When I was a kid we went out and killed grizzlies with our hands. None of these new-fangled ideas—"

"Grandpa," Gallegher said, "shut

up. You're not that old. And you're a liar anyway."

"Reminds me of the time I was out in the woods and a grizzly came at me. I didn't have a gun. Well, I'll tell you. I just reached down his mouth—"

"Your bottle's empty," Gallegher said cleverly, and there was a pause while Grandpa, startled, investigated. It wasn't.

"You were highly recommended," said the eager man. "I do hope you can help me. My partner and I are about at the end of our rope."

Gallegher looked at him dazedly. "You have a partner? Who's he? For that matter, who are you?"

Dead silence fell while the eager man fought with his bafflement. Grandpa lowered his bottle and said: "It wasn't empty, but it is now. Where's another?"

The eager man blinked. "Mr. Gallegher," he said faintly. "I don't understand. We've been discussing—"

Gallegher said, "I know. I'm sorry. It's just that I'm no good on technical problems unless I'm . . . ah . . . stimulated. Then I'm a genius. But I'm awfully absent-minded. I'm sure I can solve your problem, but the fact is I've forgotten what it is. I suggest you start from the beginning. Who are you and have you given me any money yet?"

"I'm Jonas Harding," the eager man said. "I've got fifty thousand credits in my pocket, but we haven't come to any terms yet."

"Then give me the dough and we'll come to terms," Gallegher said with ill-concealed greed. "I need money."

"You certainly do," Grandpa put in, searching for a bottle. "You're so overdrawn at the bank that they lock the doors when they see you coming. I want a drink."

"Try the organ," Gallegher suggested. "Now, Mr. Harding—"

"I want a bottle. I don't trust that dohinkus of yours."

Harding, for all his eagerness, could not quite conceal a growing skepticism. "As for the credits," he said, "I think perhaps we'd better talk a little first. You were very highly recommended, but perhaps this is one of your off days."

"Not at all. Still—"

"Why should I give you the money before we come to terms?" Harding pointed out. "Especially since you've forgotten who I am and what I wanted."

Gallegher sighed and gave up. "All right. Tell me what you are and who you want. I mean—"

"I'll go back home," Grandpa threatened. "Where's a bottle?"

Harding said desperately, "Look, Mr. Gallegher, there's a limit. I come in here and that robot of yours insults me. Your grandfather insists I have a drink with him. I'm nearly poisoned—"

"I was weaned on corn likker," Grandpa muttered. "Young whippersnappers can't take it."

"Then let's get down to business," Gallegher said brightly. "I'm beginning to feel good. I'll just relax here on the couch and you can tell me everything," He relaxed and sucked idly at the organ's mouth-

piece, which trickled a gin and buck. Grandpa cursed.

"Now," Gallegher said, "the whole thing, from the beginning."

Harding gave a little sigh. "Well—I'm half partner in Adrenals, Incorporated. We run a service. A luxury service, keyed to this day and age. As I told you—"

"I've forgotten it all," Gallegher murmured. "You should have made a carbon copy. What is it you do? I've got a mad picture of you building tiny prefabricated houses on top of kidneys, but I know I must be wrong."

"You are," Harding said shortly. "Here's your carbon copy. We're in the adrenal-rousing business. Today man lives a quiet, safe life—"

"Ha!" Gallegher interjected bitterly.

"—what with safety controls and devices, medical advances, and the general structure of social living. Now the adrenal glands serve a vital functional purpose, necessary to the health of the normal man." Harding had apparently launched into a familiar sales talk. "Ages ago we lived in caves, and when a saber-tooth burst out of the jungle, our adrenals, or suprarenals, went into instant action, flooding our systems with adrenalin. There was an immediate explosion of action, either toward fight or flight, and such periodic flooding of the blood stream gave tone to the whole system. Not to mention the psychological advantages. Man is a competitive animal. He's losing that instinct, but it can be roused by artificial stimulation of the adrenals."

"A drink?" Grandpa said hopefully, though he understood practically nothing of Harding's explanation.

Harding's face became shrewder. He leaned forward confidentially.

"Glamour," he said. "That's the answer. We offer adventure. Safe, thrilling, dramatic, exciting, glamorous adventure to the jaded modern man or woman. Not the vicarious, unsatisfactory excitement of television; the real article. Adrenals, Incorporated, will give you adventure plus, and at the same time improve your health physically and mentally. You must have seen our ads: 'Are you in a rut? Are you jaded? Take a Hunt—and return refreshed, happy, and healthy, ready to lick the world!'"

"A Hunt?"

"That's our most popular service," Harding said, relapsing into more businesslike tones. "It's not new, really. A long time ago travel bureaus were advertising thrilling tiger hunts in Mexico—"

"Ain't no tigers in Mexico," Grandpa said. "I been there. I warn you, if you don't find me a bottle, I'm going right back to Maine."

But Gallegher was concentrating on the problem. "I don't see why you need me, then. I can't supply tigers for you."

"The Mexican tiger was really a member of the cat family. Puma, I think. We've got special reservations all over the world—expensive to set up and maintain—and there

we have our Hunts, with every detail carefully planned in advance. The danger must be minimized—in fact, eliminated. But there must be an illusion of danger or there's no thrill for the customer. We've tried conditioning animals so they'll stop short of hurting anyone, but . . . ah . . . that isn't too successful. We lost several customers, I'm sorry to say. This is an enormous investment, and we've got to recoup. But we've found we can't use tigers or, in fact, any of the large carnivora. It simply isn't safe. But there must be that illusion of danger! The trouble is, we're degenerating into a trapshooting club. And there's no personal danger involved in trapshooting."

Grandpa said: "Want some fun, eh? Come on up to Maine with me and I'll show you some real hunting. We still got bear back in the mountains."

Gallegher said: "I'm beginning to see. But that personal angle—I wonder! What is the definition of danger, anyhow?"

"Danger's when something's trying to git you," Grandpa pointed out.

"The unknown—the strange—is dangerous too, simply because we don't understand it. That's why ghost stories have always been popular. A roar in the dark is more frightening than a tiger in the daylight."

Harding nodded. "I see your point. But there's another factor. The game mustn't be made too easy. It's a cinch to outwit a rabbit. And, naturally, we have to supply our customers with the most modern weapons."

"Why?"

"Safety precautions. The trouble is, with those weapons and scanners and scent-analyzers, any fool can track down and kill an animal. There's no thrill involved unless the animal's a man-eating tiger, and that's a little too thrilling for our underwriters!"

"So what do you want?"

"I'm not sure," Harding said slowly. "A new animal, perhaps. One that fulfills the requirements of Adrenals, Incorporated. But I'm not sure what the answer is, or I wouldn't be asking you."

Gallegher said: "You don't make new animals out of thin air."

"Where do you get them?"

"I wonder. Other planets? Other time-sectors? Other probability-worlds? I got hold of some funny animals once—Lybblas—by tuning in on a future time-era on Mars, but they wouldn't have filled the bill."

"Other planets, then?"

Gallegher got up and strolled to his workbench. He began to piece together stray cogs and tubes. "I'm getting a thought. The latent factors inherent in the human brain—My latent factors are rousing to life. Let me see. Perhaps—"

Under his hands a gadget grew. Gallegher remained preoccupied. Presently he cursed, tossed the device aside, and settled back to the liquor-organ. Grandpa had already tried it, but choked on his first sip of a gin buck. He threatened to go

back home and take Harding with him and show him some real hunting.

Gallegher pushed the old gentleman off the couch. "Now look, Mr. Harding," he said. "I'll have this for you tomorrow. I've got some thinking to do—"

"Drinking, you mean," Harding said, taking out a bundle of credits. "I've heard a lot about you, Mr. Gallegher. You never work except under pressure. You've got to have a deadline, or you won't do a thing. Well—do you see this? Fifty thousand credits." He glanced at his wrist watch. "I'm giving you one hour. If you don't solve my problem by then, the deal's off."

Gallegher started up from the couch as though he had been bitten. "That's ridiculous. An hour isn't time enough—"

Harding said obdurately: "I'm a methodical man. I know enough about you to realize that you're not. I can find other specialists and technicians, you know. One hour! Or I go out that door and take these fifty thousand credits with me!"

Gallegher eyed the money greedily. He took a quick drink, cursed quietly, and went back to his gadget. This time he kept working on it.

After a while a light shot up from the worktable and hit Gallegher in the eye. He staggered back, yelping.

"Are you all right?" Harding asked, jumping up.

"Sure," Gallegher growled, cutting a switch. "I think I'm getting it. That light . . . ouch. I've sunburned my eyeballs." He blinked back tears. Then he went over to the liquor-organ.

After a hearty swig, he nodded at Harding. "I'm getting on the trail of what you want. I don't know how long it'll take, though." He winced. "Grandpa. Did you change the setting on this thing?"

"I dunno. I pushed some buttons."

"I thought so. This isn't a gin buck. Wheeooo!"

"Got a wallop, has it?" Grandpa said, getting interested and coming over to try the liquor-organ again.

"Not at all," Gallegher said, walking on his knees toward the audiosonic recorder. "What's this? A spy, huh? We know how to deal with spies in this house, you dirty traitor." So saying, he rose to his feet, seized a blanket, and threw it over the projector.

At that point the screen, naturally enough, was blank.

"I cleverly outwit myself every time," Gallegher remarked, rising to switch off the projector. "I go to the trouble of building that recorder and then blindfold it just when matters get interesting. I know less than I did before, because there are more unknown factors now."

"Men can know the nature of things," Joe murmured.

"An important concept," Gallegher admitted. "The Greeks found it out quite a while ago, though. Pretty soon, if you keep on thinking hard, you'll come up with the bright discovery that two and two are four."

"Be quiet, you ugly man," Joe

said. "I'm getting into abstractions now. Answer the door and leave me alone."

"The door? Why? The bell isn't singing."

"It will," Joe pointed out. "There it goes."

"Visitors at this time of the morning," Gallegher sighed. "Maybe it's Grandpa, though." He pushed a button, studied the doorplate screen, and failed to recognize the lantern-jawed, bushy-browed face. "All right," he said. "Come in. Follow the guide-line." Then he turned to the liquor-organ thirstily before remembering his current Tantalus proclivities.

The lantern-jawed man came into the room. Gallegher said: "Hurry up. I'm being followed by a little brown animal that drinks all my liquor. I've several other troubles, too, but the little brown animal's the worst. If I don't get a drink, I'll die. So tell me what you want and leave me alone to work out my problems. I don't owe you money, do I?"

"That depends," said the newcomer, with a strong Scots accent. "My name is Murdoch Mackenzie, and I assume you're Mr. Gallegher. You look untrustworthy. Where is my partner and the fifty thousand credits he had with him?"

Gallegher pondered. "Your partner, eh? I wonder if you mean Jonas Harding?"

"That's the lad. My partner in Adrenals, Incorporated."

"I haven't seen him—"

With his usual felicity, Joe remarked, "The ugly man with the big ears. How hideous he was."

"Vurra true," Mackenzie nodded. "I note you're using the past tense, or rather that great clanking machine of yours is. Have you perhaps murdered my partner and disposed of his body with one of your scientific gadgets?"

"Now look—" Gallegher said. "What's the idea? Have I got the mark of Cain on my forehead or something? Why should you jump to a conclusion like that? You're crazy."

Mackenzie rubbed his long jaw and studied Gallegher from under his bushy gray brows. "It would be no great loss, I know," he admitted. "Jonas is little help in the business. Too methodical. But he had fifty thousand credits on his person when he came here last night. There is also the question of the body. The insurance is perfectly enormous. Between ourselves, Mr. Gallegher, I would not hold it against you if you had murdered my unfortunate partner and pocketed the fifty thousand. In fact, I would be willing to consider letting you escape with . . . say . . . ten thousand, provided you gave me the rest. But not unless you provided me with legal evidence of Jonas's death, so my underwriters would be satisfied."

"Logic," Joe said admiringly. "Beautiful logic. It's amazing that such logic should come from such an opaque horror."

"I would look far more horrible, my friend, if I had a transparent skin like you," Mackenzie said, "if

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the anatomy charts are accurate. But we were discussing the matter of my partner's body."

Gallegher said wildly: "This is fantastic. You're probably laying yourself open to compounding a felony or something."

"Then you admit the charge."

"Of course not! You're entirely too sure of yourself, Mr. Mackenzie. I'll bet you killed Harding yourself and you're trying to frame me for it. How do you know he's dead?"

"Now that calls for some explanation, I admit," Mackenzie said. Jonas was a methodical man. Vurra. I have never known him to miss an appointment for any reason whatsoever. He had appointments last night, and more this morning. One with me. Moreover, he had fifty thousand credits on him when he came here to see you last night."

"How do you know he got here?"

"I brought him, in my aircab. I let him out at your door. I saw him go in."

"Well, you didn't see him go out, but he did," Gallegher said.

Mackenzie, quite unruffled, went on checking points on his bony fingers.

"This morning I checked your record, Mr. Gallegher, and it is not a good one. Unstable, to say the least. You have been mixed up in some shady deals, and you have been accused of crimes in the past. Nothing was ever proved, but you're a sly one, I suspect. The police would agree."

"They can't prove a thing. Harding's probably home in bed."

"He is not. Fifty thousand credits is a lot of money. My partner's insurance amounts to much more than that. The business will be tied up sadly if Jonas remains vanished, and there will be litigation. Litigation costs money."

"I didn't kill your partner!" Gallegher cried.

"Ah," Mackenzie smiled. "Still, if I can prove that you did, it will come to the same thing, and be reasonably profitable for me. You see your position, Mr. Gallegher. Why not admit it, tell me what you did with the body, and escape with five thousand credits."

"You said ten thousand a while ago."

"You're daft," Mackenzie said firmly. "I said nothing of the sort. At least, you canna prove that I did."

Gallegher said: "Well, suppose we have a drink and talk it over." A new idea had struck him.

"An excellent suggestion."

Gallegher found two glasses and manipulated the liquor-organ. He offered one drink to Mackenzie, but the man shook his head and reached for the other glass. "Poison, perhaps," he said cryptically. "You have an untrustworthy face."

Gallegher ignored that. He was hoping that with two drinks available, the mysterious little brown animal would show its limitations. He tried to gulp the whisky fast, but only a tantalizing drop burned on his tongue. The glass was empty. He lowered it and stared at Mackenzie.

"A cheap trick," Mackenzie said, putting his own glass down on the workbench. "I did not ask for your whisky, you know. How did you make it disappear like that?"

Furious with disappointment, Gallegher snarled: "I'm a wizard. I've sold my soul to the devil. For two cents I'd make you disappear, too."

Mackenzie shrugged. "I am not worried. If you could, you'd have done it before this. As for wizardry, I am far from skeptical, after seeing that monster squatting over there." He indicated the third dynamo that wasn't a dynamo.

"What? You mean you see it, too?"

"I see more than you think, Mr. Gallegher," Mackenzie said darkly. "In fact, I am going to the police now."

"Wait a minute. You can't gain anything by that—"

"I can gain nothing by talking to you. Since you remain obdurate, I will try the police. If they can prove that Jonas is dead, I will at least collect his insurance."

Gallegher said: "Now wait a minute. Your partner did come here. He wanted me to solve a problem for him."

"Ah. And have you solved it?"

"N-no At least—"

"Then I can get no profit from you," Mackenzie said firmly, and turned to the door. "You will hear from me vurra soon."

He departed. Gallegher sank down miserably on the couch and brooded. Presently he lifted his eyes to stare at the third dynamo.

It was not, then, a hallucination, as he had at first suspected. Nor was it a dynamo. It was a squat, shapeless object like a truncated pyramid that had begun to melt down, and two large blue eyes were watching him. Eyes, or agates, or painted metal. He couldn't be sure. It was about three feet high and three feet in diameter at the base.

"Joe," Gallegher said, "why didn't you tell me about that thing?"

"I thought you saw it," Joe explained.

"I did, but—what is it?"

"I haven't the slightest idea."

"Where could it have come from?"

"Your subconscious alone knows what you were up to last night," Joe said. "Perhaps Grandpa and Jonas Harding know, but they're not around, apparently."

Gallegher went to the teleview and put in a call to Maine. "Grandpa may have gone back home. It isn't likely he'd have taken Harding with him, but we can't miss any bets. I'll check on that. One thing, my eyes have stopped watering. What *was* that gadget I made last night?" He passed to the workbench and studied the cryptic assemblage. "I wonder why I put a shoehorn in that circuit?"

"If you'd keep a supply of materials available here, Gallegher Plus wouldn't have to depend on makeshifts," Joe said severely.

"Uh. I could get drunk and let my subconscious take over again . . . no, I can't. Joe, I can't drink any

more! I'm bound hand and foot to the water wagon!"

"I wonder if Dalton had the right idea after all?"

Gallegher snarled: "Do you have to extrude your eyes that way? I need help!"

"You won't get it from me," Joe said. "The problem's extremely simple, if you'd put your mind to it."

"Simple, is it? Then suppose you tell me the answer!"

"I want to be sure of a certain philosophical concept first."

"Take all the time you want. When I'm rotting in jail, you can spend your leisure hours pondering abstracts. *Get me a beer!* No, never mind. I couldn't drink it anyway. What does this little brown animal look like?"

"Oh, use your head," Joe said.

Gallegher growled, "I could use it for an anchor, the way it feels. You know all the answers. Why not tell me instead of babbling?"

"Men can know the nature of things," Joe said. "Today is the logical development of yesterday. Obviously you've solved the problem Adrenals, Incorporated, gave you."

"What? Oh. I see. Harding wanted a new animal or something."

"Well?"

"I've got two of 'em," Gallegher said. "That little brown invisible dipsomaniac and that blue-eyed critter sitting on the floor. Oh-*ho!* Where did I pick them up? Another dimension?"

"How should I know? You've got 'em."

"I'll say I have," Gallegher agreed. "Maybe I made a machine that scooped them off another world—and maybe Grandpa and Harding are on that world now! A sort of exchange of prisoners. I don't know. Harding wanted nondangerous beasts elusive enough to give hunters a thrill—but where's the element of danger?" He gulped. "Conceivably the pure alienage of the critters provides that illusion. Anyway, I'm shivering."

"Flooding of the blood stream with adrenalin gives tone to the whole system," Joe said smugly.

"So I captured or got hold of those beasts somehow, apparently, to solve Harding's problem . . . mm-m." Gallegher went to stand in front of the shapeless blue-eyed creature. "Hey, you," he said.

There was no response. The mild blue eyes continued to regard nothing. Gallegher poked a finger tentatively at one of them.

Nothing at all happened. The eye was immovable and hard as glass. Gallegher tried the thing's bluish, sleek skin. It felt like metal. Repressing his mild panic, he tried to lift the beast from the floor, but failed completely. It was either enormously heavy or it had sucking-disks on its bottom.

"Eyes," Gallegher said. "No other sensory organs, apparently. That isn't what Harding wanted."

"I think it clever of the turtle," Joe suggested.

"Turtle? Oh. Like the armadillo. That's right. It's a problem, isn't it? How can you kill or capture a . . . a beast like this? Its exoderm feels plenty hard, it's im-

movable—that's it, Joe. Quarry doesn't have to depend on flight or fight. The turtle doesn't. And a barracuda could go nuts trying to eat a turtle. This would be perfect quarry for the lazy intellectual who wants a thrill. But what about adrenalin?"

Joe said nothing. Gallegher pondered, and presently seized upon some reagents and apparatus. He tried a diamond drill. He tried acids. He tried every way he could think of to rouse the blue-eyed beast. After an hour his furious curses were interrupted by a remark from the robot.

"Well, what about adrenalin?" Joe inquired ironically.

"Shut up!" Gallegher yelped. "That thing just sits there looking at me! Adren . . . what?"

"Anger as well as fear stimulates the suprarenals, you know. I suppose any human would become infuriated by continued passive resistance."

"That's right," said the sweating Gallegher, giving the creature a final kick. He turned to the couch. "Increase the nuisance quotient enough and you can substitute anger for fear. But what about that little brown animal? I'm not mad at it."

"Have a drink," Joe suggested.

"All right, I am mad at the kleptomaniacal so-and-so! You said it moved so fast I can't see it. How can I catch it?"

"There are undoubtedly methods."

"It's as elusive as the other critter is invulnerable. Could I immobilize it by getting it drunk?"

"Metabolism."

"Burns up its fuel too fast to get drunk? Probably. But it must need a lot of food."

"Have you looked in the kitchen lately?" Joe asked.

Visions of a depleted larder filling his mind, Gallegher rose. He paused beside the blue-eyed object.

"This one hasn't got any metabolism to speak of. But it has to eat, I suppose. Still, eat what? Air? It's possible."

The doorbell sang. Gallegher moaned, "What now?" and admitted the guest. A man with a ruddy face and a belligerent expression came in, told Gallegher he was under tentative arrest, and called in the rest of his crew, who immediately began searching the house.

"Mackenzie sent you, I suppose?" Gallegher said.

"That's right. My name's Johnson. Department of Violence, Unproved. Do you want to call counsel?"

"Yes," said Gallegher, jumping at the opportunity. He used the visor to get an attorney he knew, and began outlining his troubles. But the lawyer interrupted him.

"Sorry. I'm not taking any jobs on spec. You know my rates."

"Who said anything about spec?"

"Your last check bounced yesterday. It's cash on the line this time, or no deal."

"I . . . now wait! I've just finished a commissioned job that's paying off big. I can have the money for you—"

"When I see the color of your credits, I'll be your lawyer," the

unsympathetic voice said, and the screen blanked. The detective, Johnson, tapped Gallegher on the shoulder.

"So you're overdrawn at the bank, eh? Needed money?"

"That's no secret. Besides, I'm not broke now, exactly. I finished a—"

"A job. Yeah, I heard that, too. So you're suddenly rich. How much did this job pay you? It wouldn't be fifty thousand credits, would it?"

Gallegher drew a deep breath. "I'm not saying a word," he said, and retreated to the couch, trying to ignore the Department men who were searching the lab. He needed a lawyer. He needed one bad. But he couldn't get one without money. Suppose he saw Mackenzie—

The visor put him in touch with the man. Mackenzie seemed cheerful.

"Hello," he said. "see the police have arrived."

Gallegher said, "Listen, that job your partner gave me—I've solved your problem. I've got what you want."

"Jonas's body, you mean?" Mackenzie seemed pleased.

"No! The animals you wanted! The perfect quarry!"

"Oh. Well. Why didn't you say so sooner?"

"Get over here and call off the police!" Gallegher insisted. "I tell you, I've got your ideal Hunt animals for you!"

"I dinna ken if I can call off the bloodhounds," Mackenzie said, "but I'll be over directly. I will not pay vurra much, you understand?"

"Bah!" Gallegher snarled, and broke the connection. The visor buzzed at him. He touched the receiver, and a woman's face came in.

She said: "Mr. Gallegher, with reference to your call of inquiry regarding your grandfather, we report that investigation shows that he has not returned to our Maine sector. That is all."

She vanished. Johnson said: "What's this? Your grandfather? Where's he at?"

"I ate him," Gallegher said, twitching. "Why don't you leave me alone?"

Johnson made a note. "Your grandfather. I'll just check up a bit. Incidentally, what's that thing over there?" He pointed to the blue-eyed beast.

"I've been studying a curious case of degenerative osteomyelitis affecting a baroque cephalapod!"

"Oh, I see. Thanks. Fred, see about this guy's grandfather. What are you gaping at?"

Fred said: "That screen. It's set up for projection."

Johnson moved to the audio-sonic recorder. "Better impound it. Probably not important, but—" He touched a switch. The screen stayed blank, but Gallegher's voice said: *"We know how to deal with spies in this house, you dirty traitor."*

Johnson moved the switch again. He glanced at Gallegher, his ruddy face impassive, and in silence began to rewind the wire tape. Gallegher said: "Joe, get me a dull knife. I want to cut my throat, and I don't want to make it too easy for myself.

I'm getting used to doing things the hard way."

But Joe, pondering philosophy, refused to answer.

Johnson began to run off the recording. He took out a picture and compared it with what showed on the screen.

"That's Harding, all right," he said. "Thanks for keeping this for us, Mr. Gallegher."

"Don't mention it," Gallegher said. "I'll even show the hangman how to tie the knot around my neck."

"Ha-ha. Taking notes, Fred? Right."

The reel unrolled relentlessly. But, Gallegher tried to make himself believe, there was nothing really incriminating recorded.

He was disillusioned after the screen went blank, at the point when he had thrown a blanket over the recorder last night. Johnson held up his hand for silence. The screen still showed nothing, but after a moment or two voices were clearly audible.

"You have thirty-seven minutes to go, Mr. Gallegher."

"Just stay where you are. I'll have this in a minute. Besides, I want to get my hands on your fifty thousand credits."

"But—"

"Relax. I'm getting it. In a very short time your worries will be over."

"Did I say that?" Gallegher thought wildly. "What a fool I am! Why didn't I turn off the radio when I covered up the lens?"

Grandpa's voice said: *"Trying to kill me by inches, eh, you young whippersnapper!"*

"All the old so-and-so wanted was another bottle," Gallegher moaned to himself. "But try to make those flatfeet believe that! Still—" He brightened. "Maybe I can find out what really happened to Grandpa and Harding. If I shot them off to another world, there might be some clue—"

"Watch closely now," Gallegher's voice said from last night. *"I'll explain as I proceed. Oh-oh. Wait a minute. I'm going to patent this later, so I don't want any spies. I can trust you two not to talk, but that recorder's still turned on to audio. Tomorrow, if I played it back, I'd be saying to myself, 'Gallegher, you talk too much. There's only one way to keep a secret safe.' Off it goes!"*

Someone screamed. The shriek was cut off midway. The projector stopped humming. There was utter silence.

The door opened to admit Murdoch Mackenzie. He was rubbing his hands.

"I came right down," he said briskly. "So you've solved our problem, eh, Mr. Gallegher? Perhaps we can do business then. After all, there's no real evidence that you killed Jonas—and I'll be willing to drop the charges, *if* you've got what Adrenals, Incorporated, wants."

"Pass me those handcuffs, Fred," Johnson requested.

Gallegher protested. "You can't do this to me!"

"A fallacious theorem," Joe said,

"which, I note, is now being disproved by the empirical method. How illogical all you ugly people are."

The social trend always lags behind the technological one. And while technology tended, in these days, toward simplification, the social pattern was immensely complicated, since it was partly an outgrowth of historical precedent and partly a result of the scientific advance of the era. Take jurisprudence. Cockburn and Blackwood and a score of others had established certain general and specific rules—say, regarding patents—but those rules could be made thoroughly impractical by a single gadget. The Integrators could solve problems no human brain could manage, so, as a governor, it was necessary to build various controls into those semimechanical colloids. Moreover, an electronic duplicator could infringe not only on patents but on property rights, and attorneys prepared voluminous briefs on such questions as whether "rarity rights" are real property, whether a gadget made on a duplicator is a "representation" or a copy, and whether mass-duplication of chinchillas is unfair competition to a chinchilla breeder who depended on old-fashioned biological principles. All of which added up to the fact that the world, slightly punch-drunk with technology, was trying desperately to walk a straight line. Eventually the confusion would settle down.

It hadn't settled down yet.

So legal machinery was a construction far more complicated than an Integrator. Precedent warred with abstract theory as lawyer warred with lawyer. It was all perfectly clear to the technicians, but they were much too impractical to be consulted; they were apt to remark wickedly, "So my gadget unstabilizes property rights? Well—why have property rights, then?"

And you can't do that!

Not to a world that had found security, of a sort, for thousands of years in rigid precedents of social intercourse. The ancient dyke of formal culture was beginning to leak in innumerable spots, and, had you noticed, you might have seen hundreds of thousands of frantic, small figures rushing from danger-spot to danger-spot, valorously, plugging the leaks with their fingers, arms, or heads. Some day it would be discovered that there was no encroaching ocean beyond that dyke, but that day hadn't yet come.

In a way, that was lucky for Gallegher. Public officials were chary about sticking their necks out. A simple suit for false arrest might lead to fantastic ramifications and big trouble. The hard-headed Murdoch Mackenzie took advantage of this situation to vise his own personal attorney and toss a monkey wrench in the legal wheels. The attorney spoke to Johnson.

There was no corpse. The audiosonic recording was not sufficient. Moreover, there were vital questions involving *habeas corpus* and search warrants. Johnson called Headquarters Jurisprudence and the ar-

gument raged over the heads of Gallegher and the imperturbable Mackenzie. It ended with Johnson leaving, with his crew—and the increasing recording—and threatening to return as soon as a judge could issue the appropriate writs and papers. Meanwhile, he said, there would be officers on guard outside the house. With a malignant glare for Mackenzie, he stamped out.

"And now to business," said Mackenzie, rubbing his hands. "Between ourselves"—he leaned forward confidentially—"I'm just as glad to get rid of that partner of mine. Whether or no you killed him, I hope he stays vanished. Now I can run the business my way, for a change."

"It's all right about that," Gallegher said, "but what about me? I'll be in custody again as soon as Johnson can wangle it."

"But not convicted," Mackenzie pointed out. "A clever lawyer can fix you up. There was a similar case in which the defendant got off with a defense of *non esse*—his attorney went into metaphysics and proved that the murdered man had never existed. Quite specious, but so far the murderer's gone free."

Gallegher said: "I've searched the house, and Johnson's men did, too. There's simply no trace of Jonas Harding or my grandfather. And I'll tell you frankly, Mr. Mackenzie, I haven't the slightest idea what happened to them."

Mackenzie gestured airily. "We must be methodical. You mentioned you had solved a certain problem for Adrenals, Incorporated. Now, I'll admit, that interested me."

Silently Gallegher pointed to the blue-eyed dynamo. Mackenzie studied the object thoughtfully.

"Well?" he said.

"That's it. The perfect quarry."

Mackenzie walked over to the thing, rapped its hide, and looked deeply into the mild azure eyes. "How fast can it run?" he asked shrewdly.

Gallegher said: "It doesn't have to run. You see, it's invulnerable."

"Ha. Hum. Perhaps if you'd explain a wee bit more—"

But Mackenzie did not seem pleased with the explanation. "No," he said, "I don't see it. There would be no thrill to hunting a critter like that. You forget our customers demand excitement—adrenal stimulation."

"They'll get it. Anger has the same effect as rage—" Gallegher went into detail.

But Mackenzie shook his head. "Both fear and anger give you excess energy you've got to use up. You can't, against a passive quarry. You'll just cause neuroses. We try to get rid of neuroses, not create them."

Gallegher, growing desperate, suddenly remembered the little brown beast and began to discuss that. Once Mackenzie interrupted with a demand to see the creature. Gallegher slid around that one fast.

"Ha," Mackenzie said finally. "It isna canny. How can you hunt something that's invisible?"

"Oh—ultraviolet. Scent-analyzers. It's a test for ingenuity—"

"Our customers are not ingenious. They don't want to be. They want a change and a vacation from routine, hard work—or easy work, as the case may be—they want a rest. They don't want to beat their brains working out methods to catch a thing that moves faster than a pixy, nor do they want to chase a critter that's out of sight before it even gets there. You are a vurra clever man, Mr. Gallegher, but it begins to look as though Jonas's insurance is my best bet after all."

"Now wait—"

Mackenzie pursed his lips. "I'll admit the beasties *may*—I say may—have some possibilities. But what good is quarry that can't be caught? Perhaps if you'd work out a way to capture these other-worldly animals of yours, we might do business. At present, I willna buy a pig in a poke."

"I'll find a way," Gallegher promised wildly. "But I can't do it in jail."

"Ah. I am a little irritated with

you, Mr. Gallegher. You tricked me into believing you had solved our problem. Which you havena done —yet. Consider the thought of jail. Your adrenalin may stimulate your brain into working out a way to trap these animals of yours. Though, even so, I can make no rash promises—"

Murdoch Mackenzie grinned at Gallegher and went out, closing the door softly behind him. Gallegher began to dine off his finger nails.

"Men can know the nature of things," Joe said, with an air of solid conviction.

At that point matters were complicated even further by the appearance, on the televisor screen, of a gray-haired man who announced that one of Gallegher's checks had just bounced. Three hundred and fifty credits, the man said, and how about it?

Gallegher looked dazedly at the identification card on the screen. "You're with United Cultures? What's that?"

The gray-haired man said silkily, "Biological and medical supplies and laboratories, Mr. Gallegher."

"What did I order from you?"

"We have a receipt for six hundred pounds of Vitaplasm, first grade. We made delivery within an hour."

"And when—"

The gray-haired man went into more detail. Finally Gallegher made a few lying promises and turned from the blanking screen. He looked wildly around the lab.

"Six hundred pounds of artificial protoplasm," he murmured. "Ordered by Gallegher Plus. He's got delusions of economic grandeur."

"It was delivered," Joe said. "You signed the receipt, the night Grandpa and Jonas Harding disappeared."

"But what could I do with the stuff? It's used for plastic surgery and for humano-prosthesis. Artificial limbs and stuff. It's cultured cellular tissue, this Vitaplasm. Did I use it to *make* some animals? That's biologically impossible. I think. How could I have molded Vitaplasm into a little brown animal that's invisible? What about the brain and the neural structure? Joe, six hundred pounds of Vitaplasm has simply disappeared. Where has it gone?"

But Joe was silent.

Hours later Gallegher was furiously busy. "The trick is," he explained to Joe, "to find out all I can about those critters. Then maybe I can tell where they came from and how I got 'em. Then perhaps I can discover where Grandpa and Harding went. Then—"

"Why not sit down and think about it?"

"That's the difference between us. You've got no instinct of self-preservation. You could sit down and think while a chain reaction took place in your toes and worked up, but not me. I'm too young to die. I keep thinking of Reading Gaol. I need a drink. If I could only get high, my demon subconscious could work out the whole problem for me. Is that little brown animal around?"

"No," Joe said.

"Then maybe I can steal a drink." Gallegher exploded, after an abortive attempt that ended in utter failure: "Nobody can move *that* fast."

"Accelerated metabolism. It must have smelled the alcohol. Or perhaps it has additional senses. Even I can scarcely varish it."

"If I mixed kerosene with the whisky, maybe the dipsomaniacal little monster wouldn't like it. Still, neither would I. Ah, well. Back to the mill," Gallegher said, as he tried reagent after reagent on the blue-eyed dynamo, without any effect at all.

"Men can know the nature of things," Joe said irritatingly.

"Shut up. I wonder if I could electroplate this creature? That would immobilize it, all right. But it's immobilized already. How does it eat?"

"Logically, I'd say osmosis."

"Very likely. Osmosis of what?"

Joe clicked irritatedly. "There are dozens of ways you could solve your problem. Instrumentalism. Determinism. Vitalism. Work from *a posteriori* to *a priori*. It's perfectly obvious to me that you've solved the problem Adrenals, Incorporated, set you."

"I have?"

"Certainly."

"How?"

"Very simple. Men can know the nature of things."

"Will you stop repeating that outmoded basic and try to be useful? You're wrong, anyway. Men can know the nature of things by experiment and reason combined!"

Joe said: "Ridiculous. Philosophical incompetence. If you can't prove your point by logic, you've failed. Anybody who has to depend on experiment is beneath contempt."

"Why should I sit here arguing philosophical concepts with a robot?" Gallegher demanded of no one in particular. "How would you like me to demonstrate the fact that ideation is dependent on your having a radioatomic brain that isn't scattered all over the floor?"

"Kill me, then," Joe said. "It's your loss and the world's. Earth will be a poorer place when I die. But coercion means nothing to me. I have no instinct of self-preservation."

"Now look," Gallegher said, trying a new tack, "if you know the answer, why not tell me? Demonstrate that wonderful logic of yours. Convince me without having to depend on experiment. Use pure reason."

"Why should I want to convince you? *I'm* convinced. And I'm so beautiful and perfect that I can achieve no higher glory than to admire me."

"Narcissus," Gallegher snarled. "You're a combination of Narcissus and Nietzsche's Superman."

"Men can know the nature of things," Joe said.

The next development was a subpoena for the transparent robot. The legal machinery was beginning to move, an immensely complicated gadget that worked on a logic as apparently twisted as Joe's own. Gallegher himself, it seemed, was

temporarily inviolate, through some odd interpretation of jurisprudence. But the State's principle was that the sum of the parts was equal to the whole. Joe was classified as one of the parts, the total of which equaled Gallegher. Thus the robot found itself in court, listening to a polemic with impassive scorn.

Gallegher, flanked by Murdoch Mackenzie and a corps of attorneys, was with Joe. This was an informal hearing. Gallegher didn't pay much attention; he was concentrating on finding a way to put the bite on the recalcitrant robot, who knew all the answers but wouldn't talk. He had been studying the philosophers, with an eye toward meeting Joe on his own ground, but so far had succeeded only in acquiring a headache and an almost unendurable longing for a drink. Even out of his laboratory, though, he remained Tantalus. The invisible little brown animal followed him around and stole his liquor.

One of Mackenzie's lawyers jumped up. "I object," he said. There was a brief wrangle as to whether Joe should be classified as a witness or as Exhibit A. If the latter, the subpoena had been falsely served. The Justice pondered.

"As I see it," he declared, "the question is one of determinism versus voluntarism. If this . . . ah . . . robot has free will—"

"Ha!" Gallegher said, and was shushed by an attorney. He subsided rebelliously.

"—then it, or he, is a witness. But, on the other hand, there is the possibility that the robot, in acts of apparent choice, is the mechanical expression of heredity and past environment. For heredity read . . . ah . . . initial mechanical basics."

"Whether or not the robot is a rational being, Mr. Justice, is beside the point," the prosecutor put in.

"I do not agree. Law is based on *res*—"

Joe said: "Mr. Justice, may I speak?"

"Your ability to do so rather automatically gives you permission," the Justice said, studying the robot in a baffled way. "Go ahead."

Joe had seemingly found the connection between law, logic, and philosophy. He said happily: "I've figured it all out. A thinking robot is a rational being. I am a thinking robot—therefore I am a rational being."

"What a fool," Gallegher groaned, longing for the sane logics of electronics and chemistry. "The old Socratic syllogism. Even I could point out the flaw in that!"

"Quiet," Mackenzie whispered. "All the lawyers really depend on is tying up the case in such knots nobody can figure it out. Your robot is perhaps not such a fool as you think."

An argument started as to whether thinking robots really were rational beings. Gallegher brooded. He couldn't see the point, really. Nor did it become clear until, from the maze of contradictions, there emerged the tentative decision that Joe was a rational being. This seemed to please the prosecutor immensely.

"Mr. Justice," he announced, "we have learned that Mr. Galloway Gallegher two nights ago inactivated the robot before us now. Is this not true, Mr. Gallegher?"

But Mackenzie's hand kept Gallegher in his seat. One of the defending attorneys rose to meet the question.

"We admit nothing," he said. "However, if you wish to pose a theoretical question, we will answer it."

The query was posed theoretically.

"Then the theoretical answer is 'yes,' Mr. Prosecutor. A robot of this type can be turned on and off at will."

"Can the robot turn itself off?"

"Yes."

"But this did not occur? Mr. Gallegher inactivated the robot at the time Mr. Jonas Harding was with him in his laboratory two nights ago?"

"Theoretically, that is true. There was a temporary inactivation."

"Then," said the prosecutor, "we wish to question the robot, who has been classed as a rational being."

"The decision was tentative," a defense attorney objected.

"Accepted. Mr. Justice—"

"All right," said the Justice, who was still staring at Joe, "you may ask your questions."

"Ah . . . ah—" The prosecutor, facing the robot, hesitated.

"Call me Joe," Joe said.

"Thank you. Ah . . . is this true? Did Mr. Gallegher inactivate you at the time and place stated?"

"Yes."

"Then," the prosecutor said triumphantly, "I wish to bring a charge of assault and battery against Mr. Gallegher. Since this robot has been tentatively classed as a rational being, any activity causing him, or it, to lose consciousness or the power of mobility is *contra bonos mores*, and may be classed as mayhem."

Mackenzie's attorneys were ruffled. Gallegher said: "What does that mean?"

A lawyer whispered: "They can hold you, and hold that robot as a witness." He stood up. "Mr. Justice. Our statements were in reply to purely theoretical questions."

The prosecutor said: "But the robot's statement answered a non-theoretical question."

"The robot was not on oath."

"Easily remedied," said the prosecutor, while Gallegher saw his last hopes slipping rapidly away. He thought hard, while matters proceeded.

"Do you solemnly swear to tell the truth the whole truth and nothing but the truth so help you God?"

Gallegher leaped to his feet. "Mr. Justice. I object."

"Indeed. To what?"

"To the validity of that oath."

Mackenzie said: "Ah-*ha!*"

The Justice was thoughtful. "Will you please elucidate, Mr. Gallegher? Why should the oath not be administered to this robot?"

"Such an oath is applicable to man only."

"And?"

"It presupposes the existence of the soul. At least it implies theism,

a personal religion. Can a robot take an oath?"

The Justice eyed Joe. "It's a point, certainly. Ah . . . Joe. Do you believe in a personal deity?"

"I do."

The prosecutor beamed. "Then we can proceed."

"Wait a minute," Murdoch Mackenzie said, rising. "May I ask a question, Mr. Justice?"

"Go ahead."

Mackenzie stared at the robot. "Well, now. Will you tell me, please, what this personal deity of yours is like?"

"Certainly," Joe said. "Just like me."

After a while it degenerated into a theological argument. Gallegher left the attorneys debating the apparently vital point of how many angels could dance on the head of a pin, and went home temporarily scot-free, with Joe. Until such points as the robot's religious basics were settled, nothing could be done. All the way, in the aircab, Mackenzie insisted on pointing out the merits of Calvinism to Joe.

At the door Mackenzie made a mild threat. "I did not intend to give you so much rope, you understand. But you will work all the harder with the threat of prison hanging over your head. I don't know how long I can keep you a free man. If you can work out an answer quickly—"

"What sort of answer?"

"I am easily satisfied. Jonas's body, now—"

"Bah!" Gallegher said, and went into his laboratory and sat down morosely. He siphoned himself a drink before he remembered the little brown animal. Then he lay back, staring from the blue-eyed dynamo to Joe and back again.

Finally he said: "There's an old Chinese idea that the man who first stops arguing and starts swinging with his fists admits his intellectual defeat."

Joe said: "Naturally. Reason is sufficient; if you need experiment to prove your point, you're a lousy philosopher and logician."

Gallegher fell back on casuistry. "First step, animal. Fist-swinging. Second step, human. Pure logic. But what about the third step?"

"What third step?"

"Men can know the nature of things—but you're not a man. Your personal deity isn't an anthropomorphic one. Three steps; animal, man, and what we'll call for convenience superman, though *man* doesn't necessarily enter into it. We've always attributed godlike traits to the theoretical superbeing. Suppose, just for the sake of having a label, we call this third-stage entity Joe."

"Why not?" Joe said.

"Then the two basic concepts of logic don't apply. Men can know the nature of things by pure reason, and also by experiment *and* reason. But such second-stage concepts are as elementary to Joe as Plato's ideas were to Aristotle." Gallegher crossed his fingers behind his back. "The question is, then, what's the third-stage operation for Joe?"

"Godlike?" the robot said.

"You've got special senses, you know. You can varish, whatever that is. Do you need ordinary logical methods? Suppose—"

"Yes," Joe said, "I can varish, all right. I can skren, too. Hm-m-m."

Gallegher abruptly rose from the couch. "What a fool I am. 'DRINK ME'. That's the answer. Joe, shut up. Go off in a corner and varish."

"I'm skrenning," Joe said.

"Then skren. I've finally got an idea. When I woke up yesterday, I was thinking about a bottle labeled 'DRINK ME'. When Alice took a drink, she changed size, didn't she? Where's that reference book? I wish I knew more about technology. Vasoconstrictor . . . hemostatic . . . here it is—demonstrates the metabolic regulation mechanisms of the vegetative nervous system. Metabolism. I wonder now—"

Gallegher rushed to the workbench and examined the bottles. "Vitalism. Life is the basic reality, of which everything else is a form or manifestation. Now. I had a problem to solve for Adrenals, Incorporated. Jonas Harding and Grandpa were here. Harding gave me an hour to fill the bill. The problem . . . a dangerous and harmless animal. Paradox. That isn't it. Harding's clients wanted thrills and safety at the same time. I've got no lab animals on tap at the moment . . . *Joe!*"

"Well?"

"Watch," Gallegher said. He poured a drink and watched the liquid vanish before he tasted it. "Now. What happened?"

"The little brown animal drank it."

"Is that little brown animal, by any chance—Grandpa?"

"That's right," Joe said.

Gallegher blistered the robot's transparent hide with sulphurous oaths. "Why didn't you tell me? You—"

"I answered your question," the robot said smugly. "Grandpa's brown, isn't he? And he's an animal."

"But—little! I thought it was a critter about as big as a rabbit."

"The only standard of comparison is the majority of the species. That's the yardstick. Compared to the average height of humans, Grandpa *is* little. A little brown animal."

"So it's Grandpa, is it?" Gallegher said, returning to the workbench. "And he's simply speeded up. Accelerated metabolism. Adrenalin. Hm-m-m. Now I know what to look for, maybe—"

He fell to. But it was sundown before Gallegher emptied a small vial into a glass, siphoned whisky into it, and watched the mixture disappear.

A flickering began. Something flashed from corner to corner of the room. Gradually it became visible as a streaking brownness that resolved itself, finally, into Grandpa. He stood before Gallegher, jittering like mad as the last traces of the accelerative formula wore off.

"Hello, Grandpa," Gallegher said placatingly.

Grandpa's nutcracker face wore an expression of malevolent fury. For the first time in his life, the old gentleman was drunk. Gallegher stared in utter amazement.

"I'm going back to Maine," Grandpa cried, and fell over backwards.

"Never seen such a lot of slow pokes in my life," Grandpa said, devouring a steak. "My, I'm hungry. Next time I let you stick a needle in me I'll know better. How many months have I been like this?"

"Two days," Gallegher said, carefully mixing up a formula. "It was a metabolic accelerator, Grandpa. You just lived faster, that's all."

"All! Bah. Couldn't eat nothing. Food was solid as a rock. Only thing I could get down my gullet was liquor."

"Oh?"

"Hard chewing. Even with my store teeth. Even whisky tasted hotter. As for a steak like this, I couldn't of managed it."

"You were living faster." Gallegher glanced at the robot, who was still quietly skrenning in a corner. "Let me see. The antithesis of an accelerator is a decelerator—Grandpa, where's Jonas Harding?"

"In there," Grandpa said, pointing to the blue-eyed dynamo and thus confirming Gallegher's suspicion.

"Vitaplasm. So that was it. That's why I had a lot of Vitaplasm

sent over a couple of nights ago. Hm-m-m." Gallegher examined the sleek, impermeable surface of the apparent dynamo. After a while he tried a hypodermic syringe. He couldn't penetrate the hard shell.

Instead, using a new mixture he had concocted from the bottles on his workbench, he dripped a drop of the liquid on the substance. Presently it softened. At that spot Gallegher made an injection, and was delighted to see a color-change spread out from the locus till the entire mass was pallid and plastic.

"Vitaplasm," he exulted. "Ordinary artificial protoplasm cells, that's all. No wonder it looked hard. I'd given it a decelerative treatment. An approach to molecular stasis. Anything metabolizing that slowly would seem hard as iron." He wadded up great bunches of the surrogate and dumped it into a convenient vat. Something began to form around the blue eyes—the shape of a cranium, broad shoulders, a torso—

Freed from the disguising mass of Vitaplasm, Jonas Harding was revealed crouching on the floor, silent as a statue.

His heart wasn't beating. He didn't breathe. The decelerator held him in an unbreakable grip of passivity.

Not quite unbreakable. Gallegher, about to apply the hypodermic, paused and looked from Joe to Grandpa. "Now why did I do that?" he demanded.

Then he answered his own question.

"The time limit. Harding gave me an hour to solve his problem. Time's relative—especially when your metabolism is slowed down. I must have given Harding a shot of the decelerator so he wouldn't realize how much time had passed. Let's see." Gallegher applied a drop to Harding's impermeable skin and watched the spot soften and change hue. "Uh-huh. With Harding frozen like that, I could take weeks to work on the problem, and when he woke up, he'd figure only a short time had passed. But why did I use the Vitaplasm on him?"

Grandpa downed a beer. "When you're drunk, you're apt to do anything," he contended, reaching for another steak.

"True, true. But Gallegher Plus is logical. A strange, eerie kind of logic, but logic nevertheless. Let me see. I shot the decelerator into Harding, and then—there he was. Rigid and stiff. I couldn't leave him kicking around the lab, could I? If anybody came in, they'd think I had a corpse on my hands!"

"You mean he ain't dead?" Grandpa demanded.

"Of course not. Merely decelerated. I know! I camouflaged Harding's body. I sent out for Vitaplasm, molded the stuff around his body, and then applied the decelerator to the Vitaplasm. It works on living cellular substance—slows it down. And slowed down to that extent, it's impermeable and immovable!"

"You're crazy," Grandpa said.

"I'm short-sighted," Gallegher admitted. "At least, Gallegher Plus is. Imagine leaving Harding's eyes

visible, so I'd be reminded the guy was under that pile when I woke up from my binge! What did I construct that recorder for, anyhow? The logic Gallegher Plus uses is far more fantastic than Joe's."

"Don't bother me," Joe said. "I'm still skrenning."

Gallegher put the hypodermic needle into the soft spot on Harding's arm. He injected the accelerator, and within a moment or two Jonas Harding stirred, blinked his blue eyes, and got up from the floor. "Ouch!" he said, rubbing his arm. "Did you stick me with something?"

"An accident," Gallegher said, watching the man warily. "Uh . . . this problem of yours—"

Harding found a chair and sat down, yawning. "Solved it?"

"You gave me an hour."

"Oh. Yes, of course." Harding looked at his watch. "It's stopped. Well, what about it?"

"Just how long a time do you think has elapsed since you came into this laboratory?"

"Half an hour?" Harding hazarded.

"Two months," Grandpa snapped.

"You're both right," Gallegher said. "I'd have another answer, but I'd be right, too."

Harding obviously thought that Gallegher was still drunk. He stayed doggedly on the subject.

"What about that specialized animal we need? You still have half an hour—"

"I don't need it," Gallegher said, a great white light dawning in his mind. "I've got your answer for you. But it isn't quite what you think it is." He relaxed on the couch and considered the liquor organ. Now he could drink again, he found he preferred to prolong the anticipation.

"I came upon no wine so wonderful as thirst," he remarked.

"Claptrap," Grandpa said.

Gallegher said: "The clients of Adrenals, Incorporated, want to hunt animals. They want a thrill, so they need dangerous animals. They have to be safe, so they can't have dangerous animals. It seems paradoxical, but it isn't. The answer doesn't lie in the animal. It's in the hunter."

Harding blinked. "Come again?"

"Tigers. Ferocious man-eating tigers. Lions. Jaguars. Water buffalo. The most vicious, carnivorous animals you can get. That's part of the answer."

"Listen—" Harding said. "Maybe you've got the wrong idea. The tigers aren't our customers. We don't supply clients to the animals, it's the other way round."

"I must make a few more tests," Gallegher said, "but the basic principle's right here in my hand. An accelerator. A latent metabolic accelerator with a strong concentration of adrenalin as the catalyst. Like this—"

He sketched a vivid verbal picture.

Armed with a rifle, the client wandered through the artificial jungle, seeking quarry. He had already paid his fee to Adrenals, Incorporated, and got his intravenous

shot of the latent accelerator. That substance permeated his blood stream, doing nothing as yet, waiting for the catalyst.

The tiger launched itself from the underbrush. It shot toward the client like catapulted murder, fangs bared. As the claws neared the man's back, the suprarenals shot adrenalin into the blood stream in strong concentration.

That was the catalyst. The latent accelerative factor became active.

The client speeded up—tremendously.

He stepped away from the body of the tiger, apparently frozen in midair, and did what seemed best to him before the effect of the accelerator wore off. When it did, he returned to normal—and by that time he could be in the supply station of Adrenals, Incorporated, getting another intravenous shot—unless he'd decided to bag his tiger the easy way.

It was as simple as that.

"Ten thousand credits," Gallegher said, happily counting them. "The balance due as soon as I work out the catalytic angle. Which is a cinch. Any fourth-rate chemist could do it. What intrigues me is the forthcoming interview between Harding and Murdoch Mackenzie. When they compare the time element, it's going to be funny."

"I want a drink," Grandpa said. "Where's a bottle?"

"Even in court, I think I could prove I only took an hour or less to solve the problem. It was Harding's hour, of course, but time *is* relative. Entropy—metabolism—what a legal battle *that* would be! Still, it won't happen. I know the formula for the accelerator and Harding doesn't. He'll pay the other forty thousand—and Mackenzie won't have any kicks. After all, I'm giving Adrenals, Incorporated the success factor they needed."

"Well, I'm still going back to Maine," Grandpa contended. "Least you can do is give me a bottle."

"Go out and buy one," Gallegher said, tossing the old gentleman several credits. "Buy several. I often wonder what the vintners buy—"

"Eh?"

"—one-half so precious as the stuff they sell. No, I'm not tight. But I'm going to be." Gallegher clutched the liquor-organ's mouthpiece in a loving grip and began to play alcoholic arpeggios on the keyboard. Grandpa, with a parting sneer at such new-fangled contraptions, took his departure.

Silence fell over the laboratory. Bubbles and Monstro, the two dynamos, sat quiescent. Neither of them had bright blue eyes. Gallegher experimented with cocktails and felt a warm, pleasant glow seep through his soul.

Joe came out of his corner and stood before the mirror, admiring his gears.

"Finished skrenning?" Gallegher asked sardonically.

"Yes."

"Rational being, forsooth. You and your philosophy. Well, my fine

robot, it turned out I didn't need your help after all. Pose away."

"How ungrateful you are," Joe said, "after I've given you the benefit of my superlogic."

"Your . . . what? You've slipped a gear. What superlogic?"

"The third-stage, of course. What we were talking about a while back. That's why I was skrenning. I hope you didn't think all your problems were solved by your feeble brain, in that opaque cranium of yours."

Gallegher sat up. "What are you talking about? Third-stage logic? You didn't—"

"I don't think I can describe it to you. It's more abstruse than the noumenon of Kant, which can't be perceived except by thought. You've got to be able to skren to understand it, but—well, it's the third stage. It's . . . let's see . . . demonstrating the nature of things by making things happen by themselves."

"Experiment?"

"No. By skrenning, I reduce all things from the material plane to the realm of pure thought, and figure out the logical concepts and solutions."

"But . . . wait. Things have been *happening!* I figured out about Grandpa and Harding and worked out the accelerator—"

"You think you did," Joe said. "I simply skrenned. Which is a purely superintellectual process. After I'd done that, things couldn't help happening. But I hope you don't think they happened by themselves!"

Gallegher said: "What's skrenning?"

"You'll never know."

"But . . . you're contending you're the First Cause . . . no, it's voluntarism . . . third-stage logic? No—" Gallegher fell back on the couch, staring. "Who do you think you are? *Deus ex machina?*"

Joe glanced down at the conglomeration of gears in his torso.

"What else?" he asked smugly.

THE END.

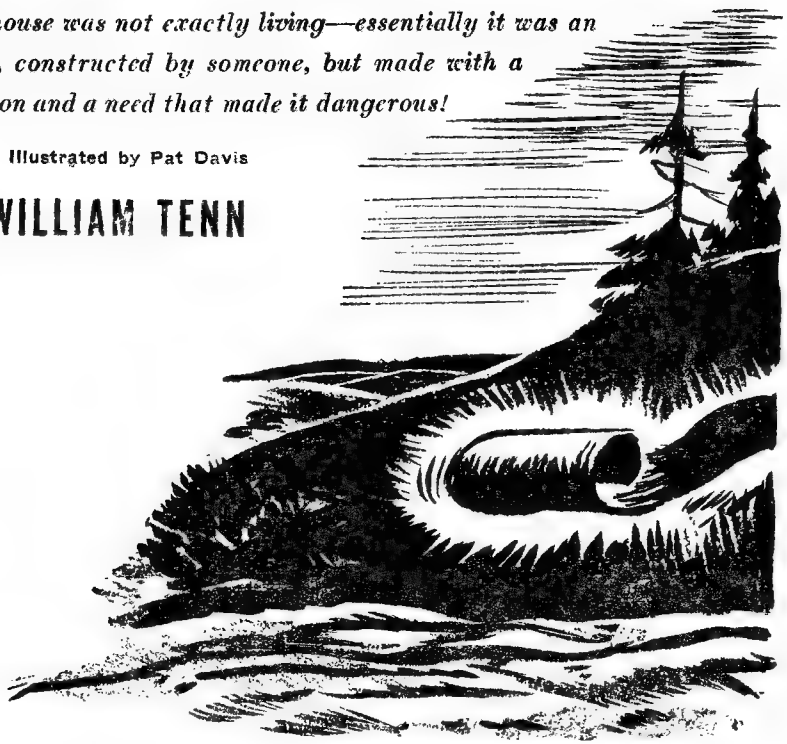
For the first time, advertising space in Astounding Science Fiction alone is being sold—a departure from the previous policy of selling only space in the Street & Smith fiction group. To readers, this should mean ads of real service and interest, directed to you and your interests. To the advertiser, this opens a new specialized medium. To publishers of technical and science-fiction books in particular, it should be welcome news. Further information on this policy will be forthcoming.

THE HOUSE DUTIFUL

The house was not exactly living—essentially it was an entity, constructed by someone, but made with a function and a need that made it dangerous!

Illustrated by Pat Davis

BY WILLIAM TENN



To—to be . . . an unformable, lonely thought groped blindly for a potential fact . . . need, a need . . . it was—something . . . it was—needed . . . it was needed! Consciousness!

A living creature came with the pride of ownership, the triggering wistfulness for it. Unlike its first darling, this creature had notions that were bizarre and primitive, conceptually agonizing. Painful, painful, painful they were to organize into. But it had purpose again—and, more, it had desire—

Thoughtlessly, lovingly, the immense thing began to flow to the fixed-upon place, twitching awkward experimental shapes upwards as it went.

The back country Canadian road was obscure even for the biting concentration of the de luxe 1958 caterpillar runabout. Metal treads apologized shrilly as they hit a rock

that was too large and too snugly imbedded in the mud. The bright yellow car canted steeply to the right and came down level again with a murky splash.

"And I was so *happy* in the dairy," Esther Sakarian moaned in histrionic recollection as she dug her unpainted, thoroughly trimmed fingernails into the lavender upholstery of the front seat. "I had my own quiet little lab, my neatly-labeled samples of milk and cheese from the day's production; at night I could walk home on cement sidewalks or drop into a dry, air-conditioned restaurant or movie. But Philadelphia wasn't good enough for me! No, I had to—"

"Bad storm last night—smooth riding, usually," Paul Marquis muttered on her left. He grimaced his glasses back into correct nose position and concentrated on the difficult ocular task of separating possible road from possible marsh.

"I had to come up to the Great Bear Lake where every prospector sneezes and all the men are vile. Adventure I wanted—hah! Well, here I am, using up the last of my girlhood as a water purification expert for a bunch of near-sighted nuclear physicists desperately hopeful that they look like characters in a Northwest romance!"

Marquis sloughed the runabout around a dwarfed red spruce that grew belligerently in the middle of the damp highway. "Should be there in a minute or two, Es. Forty of the sweetest acres that anybody ever talked the Canadian government into selling. And a little bumpy hill just off the road that's a natural foundation for the Cape Cod cottage Caroline's always talking about."

The bacteriologist prodded his shoulder tenderly. "Talking about it in Boston and building it in northern Canada—a little different, don't you think? You haven't married the gal yet."

"You don't know Caroline," Marquis told her confidently. "Besides, we'll be only forty miles from Little Fermi—and the town will grow. The lode we're working on seems to be about ten times as rich as the Eldorado mine over at Port Radium. If it holds up, we'll build a uranium pile that will be a power plant for the entire western hemisphere. Business will get interested, real estate values will boom—"

"So it's a good investment, too? Now don't pout, but I have a dim belief that you bought the swamp-happy acreage to give yourself a reason for this gaudy monstrosity you ordered when everyone else got a 'copter. Why is it that physical scientists on both of the outermost frontiers—the star-classifiers and the electron-prodders—have to be the roaringest romantics and mystics of them all? Like your opinion that a lifetime spent behind Beacon Street cotton wool can produce the peculiar combination of frantic housemaid and lambent inspiration that you want in a wife."

"Now you sound like that pill-roller Connor Kuntz when I beat his classic Capablancan chess with an inspirational heresy. *There's* a nineteenth-century mechanist with whom you could be happy; all he wants is a mate of good disposition and fair heredity who will be absorbed in her work and let him do his bone-setting in peace. I don't want a mate—I want a marriage. No servant any employment agency ever—"

"Dr. Kuntz is a mass of greasy rationalizations. And I wasn't proposing to you by indirection. You're had, lad."

"—ever sent out," he went on doggedly, "could handle the menial essentials of domestic living with the affection and grace of a wife, a good wife. The best machines made stop this side of habit, and, even if they didn't, you can't get omnipresent, understanding love from a machine. Not that I'm marrying Caroline just to get someone who'll kiss me while she's preparing dinners I like—"

"Of course not! It's comfortable, though, to know you'll get it just

the same. Which you wouldn't if you married, say . . . oh, say a female bacteriologist who had work of her own to do and would be as tired as you at the end of the day. All this, mind you, even if you'd confided to the female bacteriologist that you found her an ideal person with whom to discuss lab kinks and personal aspirations. Up with the double standard; but, this time, keep it intellectual!"

The excessively thin young man slapped the car to a stop and turned with his mouth open for a blast. Esther Sakarian was one of those tidy, docile-appearing women whose remarks generated a surprising amount of frictional heat in men.

"Look here, Es," he began loudly, "social development and the relatively new integrity of the individual to one side, people still consist of men and women. Women—with the exception of maladjusted—"

"Hey, there!" Esther was staring over his shoulder with her nostrils flaring respectfully. "You've done quite a job! It doesn't look a bit prefabricated, Paul. But it must have been expensive getting priorities for those sections on the Diesel snow trains. And you banged it together in one week by yourself? Quite a job!"

"I would appreciate it if you stopped raving and told me—"

"Your house . . . your Cape Cod cottage! It's perfect."

"My *what?*" Paul Marquis' head spun 'round like a good servomechanism.

Esther slid the right-hand door back into its slot and stepped delicately onto the mud. "I'll bet you have it half furnished, too. And full of the crazy domestic gimmicks you're always working out. Downy old duck, aren't you? 'Come on, Es, I want to ask your advice on where to stick a house on that land I bought!' So go on and smirk: don't worry, I won't have the gall to say I knew it all the time."

Marquis watched the progress of her feminized blue jeans up the bush-infested hill toward the green and white cottage with anything but a smirk. His tongue rolled out of his mouth and slapped moisture on his working lips—moisture which seemed to be used up as fast as it was applied. His eyes, after a couple of wistful attempts at running broad jumps from their sockets, settled down into an earnest conference with each other. Occasionally he said, "Whul?"; at other times, he said, "Nipe!" At no time did he smirk.

Finally, he swung madly over the side, slipped headlong into the mud, picked himself up and clambered on, dripping great brown chunks of Canadian soil as he thudded up the slope.

Esther nodded at him as he approached, her hand truculent on the long, old-fashioned doorknob. "What's the sense of locking doors in this wilderness? If anyone were going to burglarize, they could smash a window quite easily and help themselves while you were away. Well, don't stand there looking philosophical—make with the key, make with the key!"

"The . . . the key." Dazed, he took a small key chain out of his pocket, looked at it for a moment, then shoved it back violently. He ran a hand through a tangle of blond hair and leaned against the door. It opened.

The bacteriologist trotted past him as he clawed at the post to retain his balance. "Never could get the hang of those prehistoric gadgets. Photoelectric cells will be good enough for my children, and they're good enough for me. Oh, Paul! Don't tell me your sense for the fitness of things extends no further than atomic nuclei. Look at that furniture!"

"Furniture?" he asked very weakly. Slowly, he opened eyes which had been tightly closed while he leaned against the door. He took in the roomful of chairs and tables done in the sprouting-from-one-center-leg style which was currently popular. "Furniture!" he sighed and carefully closed his eyes again.

Esther Sakarian shook her round head with assurance. "1958 Single-Support just doesn't go in a Cape Cod cottage. Believe me, Paul, your poetic soul may want to placate your scientific mind by giving it superfunctional surroundings, but you can't do it in this kind of a house. Furthermore, just by looking at that retouched picture of Caroline you have pasted to your Geiger counter. I know she wouldn't approve. You'll have to get rid of at least—"

He had come up to her side and stood plucking the sleeve of her bright plaid shirt. "Esther," he muttered, "my dear, sweet, talkative, analytical, self-confident Esther —please sit down and shut up!"

She dropped into a roundly curved seat, staring at him from angled eyebrows. "You have a point to make?"

"I have a point to make!" Paul told her emphatically. He waved wildly at the modern furniture which seemed to be talking slang in the pleasant, leisurely room. "All this, the house, the furniture, the accessories, was not only not built nor sent here by me, but . . . but wasn't here a week ago when I came out with the man from the land office and bought the property. It shouldn't be here!"

"Nonsense! It couldn't just—" She broke off.

He nodded. "It did just. But that only makes me *feel* crazy. What makes me positively impatient for a jacket laced tastefully up the back is the furniture. It's the kind of furniture I thought of whenever Caroline talked about building this cottage. But the point is this: I knew she wanted to stuff it full of New England antique, and—since I feel a woman's place is in the home —I never argued the point. I never mentioned buying Single-Support to her; I've never mentioned the idea to anyone. And every chair and table in this room is exactly what I thought it should be—*privately!*"

Esther had been listening to him with an expanding frown. Now she started an uneasy giggle, and cut

it off before it began to throb. "Paul, I know you're too neurotic to be insane, and I'm willing to admit my leg isn't pretty enough for you to pull. But this . . . this—Look, the house may have been dropped by a passing plane; or possibly Charles Fort had the right idea. What you're trying to tell me about the furniture, though—It makes for belly butterflies!"

"Mine have electric fans on their wings," he assured her. "When I first saw this place, I had to look twice at the sun to make sure it hadn't turned green. When I opened the door, I knew I was color-blind. Let's amble into the kitchen. If there's a certain refrigerator-sink-stove combination—"

There was. Paul Marquis gripped the sleek enamel and whistled "The Pilgrim's Chorus" through his teeth.

"I will a-ask you to c-consider this f-fact," he said at last, shakenly. "This particular rig is one which I worked out on the back of an envelope from Caroline at three-fifteen yesterday when the big dredge got kinked up and I had nothing else to do. Prior to that time, all I knew was that I wanted something slightly different in the way of an all-in-one kitchen unit. This is what I drew."

Esther patted the sides of her face as if she were trying to slap herself back into sanity ever so gently. "Yes, I know."

"You do?"

"You may not remember, Mr. Marquis, but you showed me the drawing in the mess hall at supper. Since it was too fantastically expensive to be considered seriously, I suggested shaping the refrigerator like a sphere so that it would fit into the curve of the stove. You chucked out your lower lip and agreed. The refrigerator is shaped like a sphere and fits into the curve of the stove."

Paul opened a cupboard and pulled out a rainbow-splashed tumbler. "I'm going to get a drink, even if it's water!"

He held the tumbler under the projecting faucet and reached for a button marked "cold." Before his questing finger pressed it, however, a stream of ice-cold fluid spurted out of the faucet, filled the glass and stopped without a trickle.

The physicist exhaled at the completely dry bottom surface of the sink. He tightened his fingers convulsively on the tumbler and poured its contents down his throat. A moment passed, while his head was thrown back; then Esther, who had been leaning against the smooth wall, saw him begin to gag. She reached his side just as the coughs died away and the tears started to leak out of his eyes.

"Whoo-*oof!*" he exclaimed. "That was whisky—the finest Scotch ever to pass these tired old lips. Just as it started to pour, I thought to myself: 'What you need, friend, is a good swift slug of Scotch.' And Esther—that's what that water was! Talk about miracles!"

"I don't like this," the brown-haired woman decided positively. She pulled a small glass vial from a breast pocket. "Whisky, water or whatever it is—I'm going to get a sample and analyze it. You've no idea how many varieties of algae

I've seen in the water up here. I think the presence of radioactive ore— Hullo. It doesn't work."

With thumb and forefinger, she pressed the hot and cold water buttons until the flesh under her fingernails turned white. The faucet remained impassively dry.

Paul came over and bent his head under the metal arm. He straightened and smiled impishly. "Pour, water!" he commanded. Again water spat from the faucet, this time describing a curve to where Esther Sakarian had moved the vial to permit her companion to examine the plumbing. When the vial was full, the water stopped.

"Yup!" Paul grinned at the gasping bacteriologist. "Those buttons, the drain—they're only for display. This house does exactly what's required of it—but only when *I* require it! I have a robot house here, Es, and it's mine, *all* mine!"

She closed the vial and replaced it in her pocket. "I think it's a little more than that. Let's get out of here, Paul. Outside of the obvious impossibility of this whole business, there are a couple of things that don't check. I'd like to have Connor Kuntz up here to go over the place. Besides, we'd better get started if we're to make Little Fermi before the sun goes down."

"You don't tell Kuntz about this," Paul warned her as they moved towards the already opening door. "I don't want him fussing up my robot house with his sterile erudition and intellectual clichés."

Esther shrugged. "I won't, if you insist. But Doc Kuntz might give you a line on exactly what you have here. Hit him with the extraordinary and he'll bring five thousand years of scientific banalities to bear on it for dissection purposes. Tell me, do you notice any other change in your land since you were here last?"

The physicist stood just outside the door and swept his eyes over the tangle of bush that seasoned the glinting patches of swamp and outcropped rock. Sick orange from the beginning sunset colored the land weirdly, making the desolate subarctic plains look like the backdrop to a dying age. A young, cold wind sprang up and hurried at them, delighting in its own vigor.

"Well, over there for example. A patch of green grass extending for about a quarter mile. I remember thinking how much like a newly mowed lawn it looked, and how out of place it was in the middle of all this marsh. Over there, where you now see that stretch of absolutely blank brown soil. Of course, it could have withered and died in a week. Winter's coming on."

"Hm-m-m." She stepped back and looked up at the green roof of the cottage which harmonized so unostentatiously with the green shutters and door and the sturdy white of the walls. "Do you think—"

Paul leaped away from the door and stood rubbing his shoulder. He giggled awkwardly. "Seemed as if the post reached over and began rubbing against me. Didn't

that the bed was just the width he had always wanted. As fast as he dropped his clothes to the bedside chair, they were shaken off and pushed along a writhing strip of floor to the corner closet where he imagined they were hung neatly.

He lay down finally, repressing a shudder as the sheets curled up and over him of their own accord. Just before he fell asleep, he remembered he'd spent the largest parts of the past three nights playing chess and was likely to oversleep. He'd intended to rise early and examine his delightfully subservient property in detail, but since he hadn't thought to bring an alarm clock—

Did that matter?

He raised himself on one elbow, the sheet still hugging his chest. "Listen, you," he told the opposite wall sternly. "Wake me exactly eight hours from now. And do it pleasantly, understand?"

Wakefulness came with a sense of horror that somehow merely nibbled at his mind. He lay still, wondering what had prodded him so.

"Paul, darling, please wake up. Paul, darling, please wake up. Paul, darling, please—"

Caroline's voice! He leaped out of bed and looked around crazily. What was Caroline doing here? The telegram he'd sent asking her to come up and look at their new house had probably not arrived until breakfast. Even a plane—

Then he remembered. Of course! He patted the bed. "Nice job. Couldn't have done better myself." The headboard curled against his hand and the walls vibrated with a humming noise that was astonishingly like a baritone purr.

The shower, he decided, must have been one of those brilliant yearning concepts he had once entertained for a second or two and then forgotten. It was merely a matter of stepping into a roomy cubicle dotted with multitudes of tiny holes and being sprayed with warm lather which stopped the moment he was soaped up and was succeeded by plain water at the same temperature. As the lather washed away, needle jets of air dried him completely.

He stepped out of the shower to find his clothes hung outside, excellently pressed and smelling faintly of laundry. He was surprised at the laundry odor, although he liked it; but then again that's why there was an odor—because he liked it!

It was going to be an unusually fine day, he noted, after suggesting to the bathroom window that it open; unfortunate that he hadn't brought any light clothes with him. Then, as his eyes glanced regretfully downwards, he observed he was now wearing a sports shirt and summer slacks.

Evidently his own soiled clothes had been absorbed into the economy of the house and duplicates provided which had the pleasantly adaptive facilities of their source.

The hearts-of-palm breakfast he had worked out while strolling downstairs was ready for him in the dining room. The copy of Jane Austen's "Emma" he'd been

that there was no logical reason for nervousness.

The dining room table seemed to reach up slightly to receive the gear he dropped upon it. He patted it and headed for the kitchen.

Water still changed into whisky at his unspoken whim; as he desired, it also changed into onion soup, tomato juice and Napoleon brandy. The refrigerator, he found, was full of everything he might want, from five or six raw tenderloins to a large bottle of heavy cream complete with the brand name he usually asked for when shopping by himself.

The sight of the food made him hungry; he had missed supper. A steak suffocating under heaps of onions, surrounded by beans and washed down with plenty of hot coffee thought interestingly. He started for the dining room to collect his gear.

His haversack still rested on the near side of the table. On the far side— On the far side, there reposed a platter containing a thick steak which supported a huge mound of onions and held an encircling brown mass of beans at edible bay. Gleaming silverware lay between the platter and a veritable vase of coffee.

Paul found himself giggling hysterically and shook fear-wisps out of his head. Everything was obviously channeled for his comfort. Might as well pull up a chair and start eating. He looked around for one, in time to see a chair come gliding across the floor; it poked him delicately behind the knees and he sat down. The chair continued to the appointed position at the table.

It was while he was spooning away the last of the melon he had imagined into existence for dessert —it had been exuded, complete with dish, from the table top—that he noticed the lighting fixtures were also mere decorative devices. Light came from the walls—or the ceiling —or the floor; it was omnipresent in the house at just the right intensity—and that was all.

The dirty dishes and used silverware vanished into the table when he had finished like sugar dissolving into hot solution.

Before he went up to bed, he decided to look in at the library. Surely, he had originally imagined a library? He decided he couldn't be certain, and thought one up next to the living room.

All the books he had ever enjoyed were in the warm little space. He spent a contented hour browsing from Aiken to Einstein, until he hit the beautifully bound Brittanica. The first volume of the Encyclopedia he opened made him understand the limitations of his establishment.

The articles he had read completely were complete, those he had read in part showed only the sections he had touched. For the rest, there was a curious blur of not-quite print which puzzled him until he realized that this was just the picture the eyes retained while the pages of a book were flipped before it.

He climbed the narrow stairs to bed.

Yawningly tired, he noted vaguely

that the bed was just the width he had always wanted. As fast as he dropped his clothes to the bedside chair, they were shaken off and pushed along a writhing strip of floor to the corner closet where he imagined they were hung neatly.

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rereading recently at mealtime lay beside it open to the correct place.

He sighed happily. "All I need now is a little Mozart played softly." So, a little Mozart—

Connor Kuntz's helicopter lazed down out of the mild sky at four o'clock that afternoon. Paul thought the house into a Bunk Johnson trumpet solo and sauntered out to greet his guests.

Esther Sakarian was out of the plane first. She wore a severe black dress that made her look unusually feminine in contrast to her customary clothes. "Sorry about bringing Doc Kuntz, Paul. But for all I knew you might need a medic after a night in this place. And I don't have a 'copter of my own. He offered to give me a lift."

"Perfectly all right," he told her magnanimously. "I'm ready to discuss the house with Kuntz or any other biologist."

She held up a yellow sheet. "For you. Just came."

He read the telegram, winced and bit into his lower teeth with his uppers.

"Anything important?" Esther inquired, temporarily looking away from a pink cloud which seemed to have been fascinating her.

"Oh." He crumpled the sheet and bounced it gloomily on his open palm. "Caroline. Says she's surprised to discover I intended to make my permanent home up here. Says if I'm serious about it, I'd better reconsider our engagement."

Esther pursed her lips. "Well, it is a nice long haul from Boston. And allowing that your house isn't quite a dead issue—"

Paul laughed and snapped the paper ball into the air. "Not quite. But the way I feel at the moment: love me, love my house. And, speaking of houses— Down, sir! Down, I say!"

The house had crept down the slope behind him as he spoke, extruded a bay window and nuzzled his back with it. Now, at his sharp reproach, the window was sucked abruptly into the wall. The house sidled backwards to its place at the top of the hill and stood quivering slightly. The trumpet solo developed extremely mournful overtones.

"Does . . . does it do that often?"

"Every time I move a little distance away," he assured her. "I could stop it permanently with a direct overall command, but I find it sort of flattering. I also don't want to step on a pretty warm personality. No harm in it. Hey, Connor, what do you think?"

The doctor perspired his plump body past them and considered the noisy structure warily. "Just how —I confess I don't know."

"Better give it up, Connor," Esther advised, "or you'll rupture an analysis."

Paul slapped his back. "Come inside and I'll explain it over a couple of glasses of beer I just got thirsty enough to think about."

Five beers later, Dr. Connor Kuntz used the black beads he had in place of eyes to watch his host shimmer from the uniform of the

Coldstream Guards to a sharply cut tuxedo.

"Of course I believe it. Since it is so, it is so. You have a living house here. Now we must decide what we are to do with it."

Paul Marquis looked up, halfway into a white gabardine suit. The lapels, still tuxedo, hesitated; then gathered their energies and blended into a loose summer outfit.

"What *we* are to do with it?"

Kuntz rose and wrapped his hands behind his back, slapping the

knuckles of one into the palm of the other. "You're quite right about keeping the information secret from the men in the development; a careless word and you would be undergoing swarms of dangerously inquisitive tourists. I must get in touch with Dr. Dufayel in Quebec; this is very much his province. Although there's a young man at Johns Hopkins— How much have you learned of its basic, let us say its personal composition?"

The young physicist's face lost its grip on resentment. "Well, the wood feels like wood, the metal like metal, the plastic like plastic. And when the house produces a glass-like object, it's real glass so far as I can determine without a chemical analysis. Es, here, took—"

"That's one of the reasons I decided to bring Connor along. Biologically and chemically, the water is safe—too safe. It's absolutely pure H_2O. What do you think of my chlorophyll roof theory, doctor?"

He ducked his head at her. "Possibly. Some form of solar energy transformation in any case. But chlorophyll would argue a botanical nature, while it has distinct and varied means of locomotion—internal and external. Furthermore, the manipulation of metals which do not exist in any quantities in this region suggest subatomic reorganization of materials. Esther, we must prepare some slides from this creature. Suppose you run out to the plane like a good girl and get my kit. For that matter, you can prepare slides yourself, can't you? I want to explore a bit."

"Slides?" Paul Marquis asked uncertainly as the bacteriologist started for the open door. "It's a living thing, you know."

"Ah, we'll just take a small area from an . . . a nonvital spot. Much like scraping a bit of skin off the human hand. Tell me," the doctor requested, thumping on the table experimentally, "you no doubt have some vague theories as to origin?"

Marquis settled himself back in a gleaming chair. "As a matter of fact, they're a little more than that. I remembered the ore in Pit Fourteen gave out suddenly after showing a lot of promise. Pit Fourteen's the closest to here from Little Fermi. Adler, the geologist in charge, commented at the time that it seemed as if Pit Fourteen had been worked before—about six thousand years ago. Either that or glacial scraping. But since there was little evidence of glacial scraping in the neighborhood, and *no* evidence of a previous, prehistoric pitchblende mine, he dropped the matter. I think this house is the rest of the proof of that prehistoric mine. I also think we'll find radioactive ore all the way from this site to the edge of Pit Fourteen."

"Comfortable situation for you if they do," Kuntz observed, moving into the kitchen. Paul Marquis rose and followed him. "How would this peculiar domicile enter into the situation?"

"Well, unless our archaeology still has to grow out of its diapers, nobody on earth was interested in pitchblende six thousand years ago.

That would leave the whole wide field of extraterrestrials—from a planet of our sun or one of the other stars. This could have been a fueling station for their ships, a regularly worked mine, or an unforeseen landing to make repairs or take on fuel."

"And the house?"

"The house was their dwelling—probably a makeshift, temporary job—while they worked the mine. When they went, they left it here as humans will leave deserted wood and metal shacks when they move out of Little Fermi one day. It lay here waiting for something—say the thought of ownership or the desire for a servitor-dwelling—to release a telepathic trigger that would enable it to assume its function of—"

A despairing shout from Esther tugged them outside.

"I've just broken my second scalpel on this chunk of iridium masquerading as fragile flesh. I have a definite suspicion, Paul, that I won't so much as scratch it unless you give me permission. Please tell your house it's all right for me take a tiny chunk."

"It's . . . it's all right," Paul said uncomfortably, then added, "only, try not to hurt it too much."

Leaving the girl slicing a long, thin strip from the western corner, they walked down the cellar steps into the basement. Connor Kuntz stumbled around peering down at the floor for some example of an obviously biological organ. He found only whitewashed cement.

"Assume its function of—" he said at last. "Its function of serving! My dear fellow, do you realize this house has a sex?"

"Sex?" Paul moved aback, taken there by the thought. "You mean it can have lots of little bungalows?"

"Oh, not in the reproductive sense, not in the reproductive sense!" The plump doctor would have prodded him in the ribs if he hadn't started hurriedly up the stairs. "It has sex in the emotional, the psychological sense. As a woman wants to be a wife to a man, as a man searches for a woman to whom he can be an adequate husband—just so this house desires to be a *home* to a living creature who both needs it and owns it. As such it fulfills itself and becomes capable of its one voluntary act—the demonstration of affection, again in terms of the creature it serves. By the by, it also seems to be that theoretically happy medium in those disagreements on twentieth century domestic arrangements with which you and Esther liven up the mess hall on occasion. Unostentatious love and imaginative service."

"Does at that. If only Es didn't make a habit of plucking my nerve-ends— Hum. Have you noticed how pleasant she's been today?"

"Of course. The house has made adjustments in her personality for your greater happiness."

"*What?* Es has been changed? You're crazy, Connor!"

The doctor's thick lips flapped delightedly. "On the contrary, my boy. I assure you she was just as argumentative back in Little Fermi

and on the way out here as she ever was. The moment she saw you, she became most traditionally feminine—without losing one jot of her acuity or subtlety, remember that. When someone like Esther Sakarian who has avoided the 'You are so right, my lord' attitude all her life acquires it overnight, she has had help. In this case, the house."

Paul Marquis dug his knuckles at the solid, reassuring substance of the basement wall. "Es has been changed by the house for my possible personal convenience? I don't know if I like that. Es should be Es, good or bad. Besides, it might take a notion to change me."

The older man looked at him with a deadly twinkle. "I don't know how it affects personalities—high-order therapeutic radiation on an intellectual level?—but let me ask you this, Paul, wouldn't you like to be happy at the agreeable alteration in Miss Sakarian? And, furthermore, wouldn't you like to think that the house couldn't affect your own attitudes?"

"Of course." Paul shrugged his shoulders. "For that matter, I *am* happy about Es getting some womanly sense in her head. And, come to think of it, I doubt if you or anyone else could ever convince me that the house could push mental fixations around like so much furniture. Whole thing's too ridiculous for further discussion."

Connor Kuntz chortled and slapped his thighs for emphasis. "Perfect! And now even you can't imagine that the wish for such a state of mind made the house produce it in you. It learns to serve you better all the time! Dr. Dufayel is going to appreciate this facet of its versatility in particular."

"A point there. But I don't go for advertising my peculiar residence and its properties—whatever they are—up and down the field of research medicine. Is there any way I can persuade you to lay off?"

Kuntz stopped his dignified little dance and looked up seriously. "Why, certainly! I can think of at least two good reasons why I should never again discuss your house with anyone but you or Esther." He seemed to consider a moment. "Rather, I should say there are six or seven reasons for not mentioning your house's existence to Dufayel or any other biologist. In fact, there are literally dozens and dozens of reasons."

Paul followed Connor Kuntz and Esther back to the 'copter, promising them he'd be in for duty the next morning. "But I'm going to spend my nights here from now on."

"Take it slow and easy," Esther warned. "And don't brood over Caroline."

"Don't worry." He nodded at the affectionately trembling structure. "Have to teach it a couple of things. Like not bouncing around after me when there's company. Es, think you'd like to share it with me? You'd get as much care and affection as I would."

She giggled. "The three of us—going down the beautiful years together in a perfect marriage. We won't need any servants, just you

and I and the house. Maybe a cleaning woman once or twice a week for the sake of appearances if a real estate boom materializes and we have neighbors."

"Oh, we'll have neighbors all right," Paul boasted to include Connor Kuntz's suddenly whiter-than-usual face. "We'll become very rich once the new lode is traced to part of our property, and when Little Fermi is operating as the power city of the American continents we'll make another fortune selling the land for suburban development. And think of the research we'll be able to do in physics and bacteriology, Es, with the house supplying us with any equipment we can visualize!"

"You'll be very happy," Kuntz told them shortly. "The house will see to it that you're happy if it has to kill you—or, rather, your egos." He turned to the bacteriologist. "Esther, I thought you said yesterday that Paul would have to change a good deal before you could marry him. Has he changed, or has the house changed you?"

"Did I say that? Well, Paul hasn't exactly— But the house—"

"And how about that odd feeling you said the house gave you?" the doctor went on. "As if something were disconnecting wires in your brain and resplicing them according to a new blueprint? Don't you see that wiring blueprint belongs to Paul and the house is installing it?"

Paul had taken the girl in his arms and stood frowning at Kuntz. "I just don't like that idea, even if it is vaguely possible." His face cleared. "But it's vague enough to be impossible. Don't you think so, Es?"

She seemed to be struggling with an inner confusion that darted and shed sparks. "I . . . I don't know. Yes, I do. Impossible isn't the word for it! Why, I never heard of anything so completely— All your house wants to do is serve you. It's lovable and harmless."

"It isn't!" The physician was dancing up and down like a partridge in a net. "Admitted, it will only make psychological adjustments as required to resolve your serious inner conflicts, but remember, this house is a distinctly alien form of life. If it was ever completely controlled, the power was vested in creatures far superior to ourselves. There's danger enough, now, when it makes you think exactly as you want to think from moment to moment; but when it begins to feel the looseness of your mental reins—"

"Stow it, Connor!" Paul cut him off. "I told you I couldn't accept that line of thought. I don't want you to mention it again. It's plain ugly. Isn't it, darling?"

"And illogical." She smiled.

And Dr. Connor Kuntz was able merely to stand and think terrifying thoughts to himself.

Behind them, the house joyfully hummed a connubial snatch of "Lohengrin."

Oh, glorious master, who will never want to leave—

While the 'copter wound upwards into the sallow sky and Esther

waved at the dwindling figure below with the house skipping gayly to his side, Kuntz asked cautiously:

"If you two intend to go on any sort of honeymoon inside that place, you'll have to get a release from the company. That won't be easy."

She turned to him. "Why?"

"Because you signed a contract, and the government is backing the company on the contract. No out for either of you. Fact is, Paul may get into some trouble with his extended vacation."

Esther pondered it for a moment. "Yes, I see. And you know, Connor, with the house and all, I was sort of planning to leave the company permanently and take up residence right away. I'm pretty sure Paul feels the same way. I hope there won't be any trouble."

Then she laughed easily, and the angular frown lines disappeared from her face. "But I don't think there will be any trouble. I think everything will go smoothly. I just *feel* it."

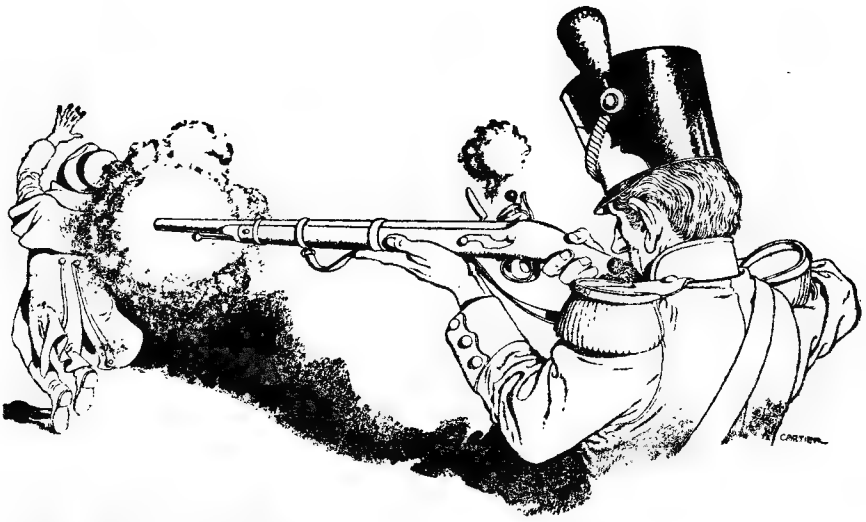
Shocked, Connor Kuntz realized that this unusual display of feminine intuition from Esther Sakarian was correct. He thought:

The house will see to it that the government voids their contracts without any trouble, because the house wants to keep them happy. It will keep them happy, giving them anything they want—except the means to get away from it. This product of some gigantic imagination has two desires actually—the desire to serve, and the desire to have a master. Having reacquired one after all these years, it will keep him, her, them, at any cost. But making adjustments in the world to keep them happy will be like knocking over the first in a row of dominoes; it will have to do more and more to keep the world from interfering.

Eventually this domestic utensil could control all humanity and make it jump at the vagrant whims of Paul Marquis and Esther Sakarian. All in the name of service! It has the power to do it, probably is nothing more itself than a collection of basic forces in temporary formful stasis. And if it does ever control the planet—why, there will be no more objection to it than Esther and Paul exhibit! This servile hunk of real estate is so far above us in capability, that it can run our world and make us think we like it. And to think I'm sitting next to one of the people whose most passing fancy could become my unalterable command! Horrible, horrible—

But by the time he had landed the 'copter at Little Fermi, Connor Kuntz no longer found the idea objectionable. He thought it quite in order that he could only do those things to which Paul and Esther did not object. Extremely natural, in fact.

THE END.



HE WALKED AROUND THE HORSES

BY H. BEAM PIPER

Illustrated by Cartier

***This** tale is based on an authenticated, documented fact. A man vanished—right out of this world. And where he went—*

In November 1809, an Englishman named Benjamin Bathurst vanished, inexplicably and utterly.

He was en route to Hamburg from Vienna, where he had been serving as his government's envoy to the court of what Napoleon had left of the Austrian Empire. At an inn in Perleburg, in Prussia, while examining a change of horses for his coach, he casually stepped out of sight of his secretary and his valet. He was not seen to leave the inn yard. He was not seen again, ever.

At least, not in this continuum . . .

(From Baron Eugen von Krutz, Minster of Police, to His Excellency the Count von Berchtenwald, Chancellor to His Majesty Friedrich Wilhelm III of Prussia.)

25 November, 1809

Your Excellency:

A circumstance has come to the notice of this Ministry, the significance of which I am at a loss to define, but, since it appears to involve matters of State, both here and abroad, I am convinced that it is of sufficient importance to be brought to your personal attention. Frankly, I am unwilling to take any further action in the matter without your advice.

Briefly, the situation is this: We are holding, here at the Ministry of Police, a person giving his name as Benjamin Bathurst, who claims to be a British diplomat. This person was taken into custody by the police at Perleburg yesterday, as a result of a disturbance at an inn there; he is being detained on technical charges of causing disorder in a public place, and of being a suspicious person. When arrested, he had in his possession a dispatch case, containing a number of papers; these are of such an extraordinary nature that the local authorities declined to assume any responsibility beyond having the man sent here to Berlin.

After interviewing this person and examining his papers, I am, I must confess, in much the same position. This is not, I am convinced, any ordinary police matter; there is something very strange and disturbing here. The man's statements, taken alone, are so incredible as to justify the assumption that he is mad. I cannot, however, adopt this theory, in view of his demeanor, which is that of a man of perfect rationality, and because of the existence of these papers. The whole thing is mad; incomprehensible!

The papers in question accompany, along with copies of the various statements taken at Perleburg, a personal letter to me from my nephew, Lieutenant Rudolf von Tarlburg. This last is deserving of your particular attention; Lieutenant von Tarlburg is a very level-headed young officer, not at all inclined to be fanciful or imaginative. It would take a good deal to affect him as he describes.

The man calling himself Benjamin Bathurst is now lodged in an apartment here at the Ministry; he is being treated with every consideration, and, except for freedom of movement, accorded every privilege.

I am, most anxiously awaiting your advice, et cetera, et cetera,

Krutz

(Report of Traugott Zeller, *Oberwachtmeister, Staatspolizei,* made at Perleburg, 25 November, 1809.)

At about ten minutes past two of the afternoon of Saturday, 25 November, while I was at the police station, there entered a man known to me as Franz Bauer, an inn servant employed by Christian Hauck, at the sign of the Sword & Scepter, here in Perleburg. This man Franz Bauer made complaint to *Staatspolizeikapitan* Ernst Hartenstein, saying that there was a madman making trouble at the inn where he, Franz Bauer, worked. I was,

therefore, directed, by *Staatspolizeikapitan* Hartenstein, to go to the Sword & Scepter Inn, there to act at discretion to maintain the peace.

Arriving at the inn in company with the said Franz Bauer, I found a considerable crowd of people in the common room, and, in the midst of them, the innkeeper, Christian Hauck, in altercation with a stranger. This stranger was a gentlemanly-appearing person, dressed in traveling clothes, who had under his arm a small leather dispatch case. As I entered, I could hear him, speaking in German with a strong English accent, abusing the innkeeper, the said Christian Hauck, and accusing him of having drugged his, the stranger's, wine, and of having stolen his, the stranger's, coach-and-four, and of having abducted his, the stranger's, secretary and servants. This the said Christian Hauck was loudly denying, and the other people in the inn were taking the innkeeper's part, and mocking the stranger for a madman.

On entering, I commanded everyone to be silent, in the king's name, and then, as he appeared to be the complaining party of the dispute, I required the foreign gentleman to state to me what was the trouble. He then repeated his accusations against the innkeeper, Hauck, saying that Hauck, or, rather, another man who resembled Hauck and who had claimed to be the innkeeper, had drugged his wine and stolen his coach and made off with his secretary and his servants. At this point, the innkeeper and the bystanders all began shouting denials and contradictions, so that I had to pound on a table with my truncheon to command silence.

I then required the innkeeper, Christian Hauck, to answer the charges which the stranger had made; this he did with a complete denial of all of them, saying that the stranger had had no wine in his inn, and that he had not been inside the inn until a few minutes before, when he had burst in shouting accusations, and that there had been no secretary, and no valet, and no coachman, and no coach-and-four, at the inn, and that the gentleman was raving mad. To all this, he called the people who were in the common room to witness.

I then required the stranger to account for himself. He said that his name was Benjamin Bathurst, and that he was a British diplomat, returning to England from Vienna. To prove this, he produced from his dispatch case sundry papers. One of these was a letter of safe-conduct, issued by the Prussian Chancellery, in which he was named and described as Benjamin Bathurst. The other papers were English, all bearing seals, and appearing to be official documents.

Accordingly, I requested him to accompany me to the police station, and also the innkeeper, and three men whom the innkeeper wanted to bring as witnesses.

Traugott Zeller
Oberwachtmeister

Report approved,
Ernst Hartenstein
Staatspolizeikapitan

(Statement of the self-so-called Benjamin Bathurst, taken at the police station at Perleburg, 25 November, 1809.)

My name is Benjamin Bathurst, and I am Envoy Extraordinary and Minster Plenipotentiary of the government of His Britannic Majesty to the court of His Majesty Franz I, Emperor of Austria, or, at least, I was until the events following the Austrian surrender made necessary my return to London. I left Vienna on the morning of Monday, the 20th, to go to Hamburg to take ship home; I was traveling in my own coach-and-four, with my secretary, Mr. Bertram Jardine, and my valet, William Small, both British subjects, and a coachman, Josef Bidek, an Austrian subject, whom I had hired for the trip. Because of the presence of French troops, whom I was anxious to avoid, I was forced to make a detour west as far as Salzburg before turning north toward Magdeburg, where I crossed the Elbe. I was unable to get a change of horses for my coach after leaving Gera, until I reached Perleburg, where I stopped at the Sword & Scepter Inn.

Arriving there, I left my coach in the inn yard, and I and my secretary, Mr. Jardine, went into the inn. A man, not this fellow here, but another rogue, with more beard and less paunch, and more shabbily dressed, but as like him as though he were his brother, represented himself as the innkeeper, and I dealt with him for a change of horses, and ordered a bottle of wine for myself and my secretary, and also a pot of beer apiece for my valet and the coachman, to be taken outside to them. Then Jardine and I sat down to our wine, at a table in the common room, until the man who claimed to be the innkeeper came back and told us that the fresh horses were harnessed to the coach and ready to go. Then we went outside again.

I looked at the two horses on the off side, and then walked around in front of the team to look at the two nigh-side horses, and as I did, I felt giddy, as though I were about to fall, and everything went black before my eyes. I thought I was having a fainting spell, something I am not at all subject to, and I put out my hand to grasp the hitching bar, but could not find it. I am sure, now, that I was unconscious for some time, because when my head cleared, the coach and horses were gone, and in their place was a big farm wagon, jacked up in front, with the right front wheel off, and two peasants were greasing the detached wheel.

I looked at them for a moment, unable to credit my eyes, and then I spoke to them in German, saying, "Where the devil's my coach-and-four?"

They both straightened, startled; the one who was holding the wheel almost dropped it.

"Pardon, excellency," he said, "there's been no coach-and-four here, all the time we've been here."

"Yes," said his mate, "and we've been here since just after noon."

I did not attempt to argue with them. It occurred to me—and it is still my opinion—that I was the victim of some plot; that my wine had been drugged, that I had been unconscious for some time, during which my coach had been removed and this wagon substituted for it, and that these peasants had been put to work on it and instructed what to say if questioned. If my arrival at the inn had been anticipated, and everything put in readiness, the whole business would not have taken ten minutes.

I therefore entered the inn, determined to have it out with this rascally innkeeper, but when I returned to the common room, he was nowhere to be seen, and this other fellow, who has given his name as Christian Hauck, claimed to be the innkeeper and denied knowledge of any of the things I have just stated. Furthermore, there were four cavalrymen, Uhlans, drinking beer and playing cards at the table where Jardine and I had had our wine, and they claimed to have been there for several hours.

I have no idea why such an elaborate prank, involving the participation of many people, should be played on me, except at the instigation of the French. In that case, I cannot understand why Prussian soldiers should lend themselves to it.

Benjamin Bathurst

(Statement of Christian Hauck, innkeeper, taken at the police station at Perleburg, 25 November, 1809.)

May it please your honor, my name is Christian Hauck, and I keep an inn at the sign of the Sword & Scepter, and have these past fifteen years, and my father, and his father, before me, for the past fifty years, and never has there been a complaint like this against my inn. Your honor, it is a hard thing for a man who keeps a decent house, and pays his taxes, and obeys the laws, to be accused of crimes of this sort.

I know nothing of this gentleman, nor of his coach, nor his secretary, nor his servants; I never set eyes on him before he came bursting into the inn from the yard, shouting and raving like a madman, and crying out, "Where the devil's that rogue of an innkeeper?"

I said to him, "I am the innkeeper; what cause have you to call me a rogue, sir?"

The stranger replied:

"You're not the innkeeper I did business with a few minutes ago, and he's the rascal I want to see. I want to know what the devil's been done with my coach, and what's happened to my secretary and my servants."

I tried to tell him that I knew nothing of what he was talking about, but he would not listen, and gave me the lie, saying that he had been drugged and robbed, and his people kidnaped. He even had the impudence to claim that he and his secretary had been sitting at a table in that room, drinking wine, not fifteen minutes before, when there had been four noncommissioned officers of the Third Uhlans at that

table since noon. Everybody in the room spoke up for me, but he would not listen, and was shouting that we were all robbers, and kidnapers, and French spies, and I don't know what all, when the police came.

Your honor, the man is mad. What I have told you about this is the truth, and all that I know about this business, so help me God.

Christian Hauck

(Statement of Franz Bauer, inn servant, taken at the police station at Perleburg, 25 November, 1809.)

May it please your honor, my name is Franz Bauer, and I am a servant at the Sword & Scepter Inn, kept by Christian Hauck.

This afternoon, when I went into the inn yard to empty a bucket of slops on the dung heap by the stables, I heard voices and turned around, to see this gentleman speaking to Wilhelm Beick and Fritz Herzer, who were greasing their wagon in the yard. He had not been in the yard when I had turned away to empty the bucket, and I thought that he must have come in from the street. This gentleman was asking Beick and Herzer where was his coach, and when they told him they didn't know, he turned and ran into the inn.

Of my own knowledge, the man had not been inside the inn before then, nor had there been any coach, or any of the people he spoke of, at the inn, and none of the things he spoke of happened there, for otherwise I would know, since I was at the inn all day.

When I went back inside, I found him in the common room, shouting at my master, and claiming that he had been drugged and robbed. I saw that he was mad, and was afraid that he would do some mischief, so I went for the police.

Franz Bauer
his (x) mark

(Statements of Wilhelm Beick and Fritz Herzer, peasants, taken at the police station at Perleburg, 25 November, 1809.)

May it please your honor, my name is Wilhelm Beick, and I am a tenant on the estate of the Baron von Hentig. On this day, I and Fritz Herzer were sent into Perleburg with a load of potatoes and cabbages which the innkeeper at the Sword & Scepter had bought from the estate superintendent. After we had unloaded them, we decided to grease our wagon, which was very dry, before going back, so we unhitched and began working on it. We took about two hours, starting just after we had eaten lunch, and in all that time, there was no coach-and-four in the inn yard. We were just finishing when this gentleman spoke to us, demanding to know where his coach was. We told him that there had been no coach in the yard all the time we had been there, so he turned around and ran into the inn. At the time, I thought that he had come out of the inn before speaking to us, for I know that he could not have come in from the street. Now I do not know where he came from, but I

know that I never saw him before that moment.

Wilhelm Beick
his (x) mark

I have heard the above testimony, and it is true to my own knowledge, and I have nothing to add to it.

Fritz Herzer
his (x) mark

(From *Staatspolizeikapitan* Ernst Hartenstein, to His Excellency, the Baron von Krutz, Minister of Police.)

25 November, 1809

Your Excellency:

The accompanying copies of statements taken this day will explain how the prisoner, the self-so-called Benjamin Bathurst, came into my custody. I have charged him with causing disorder and being a suspicious person, to hold him until more can be learned about him. However, as he represents himself to be a British diplomat, I am unwilling to assume any further responsibility, and am having him sent to your excellency, in Berlin.

In the first place, your excellency, I have the strongest doubts of the man's story. The statement which he made before me, and sigred, is bad enough, with a coach-and-four turning into a farm wagon, like Cinderella's coach into a pumpkin, and three people vanishing as though swallowed by the earth. But all this is perfectly reasonable and credible, beside the things he said to me, of which no record was made.

Your excellency will have noticed, in his statement, certain allusions to the Austrian surrender, and to French troops in Austria. After his statement had been taken down, I noticed these allusions, and I inquired, what surrender, and what were French troops doing in Austria. The man looked at me in a pitying manner, and said:

"News seems to travel slowly, hereabouts; peace was concluded at Vienna on the 14th of last month. And as for what French troops are doing in Austria, they're doing the same things Bonaparte's brigands are doing everywhere in Europe."

"And who is Bonaparte?" I asked.

He stared at me as though I had asked him, "Who is the Lord Jehovah?" Then, after a moment, a look of comprehension came into his face.

"So, you Prussians concede him the title of Emperor, and refer to him as Napoleon," he said. "Well, I can assure you that His Britannic Majesty's government haven't done so, and never will; not so long as one Englishman has a finger left to pull a trigger. General Bonaparte is a usurper; His Britannic Majesty's government do not recognize any sovereignty in France except the House of Bourbon." This he said very sternly, as though rebuking me.

It took me a moment or so to digest that, and to appreciate all its implications. Why, this fellow evidently believed, as a matter of fact, that the French Monarchy had been overthrown by some military adventurer named Bonaparte, who was calling himself the Emperor Napoleon, and who had made war

on Austria and forced a surrender. I made no attempt to argue with him—one wastes time arguing with madmen—but if this man could believe that, the transformation of a coach-and-four into a cabbage wagon was a small matter indeed. So, to humor him, I asked him if he thought General Bonaparte's agents were responsible for his trouble at the inn.

"Certainly," he replied. "The chances are they didn't know me to see me, and took Jardine for the minister, and me for the secretary, so they made off with poor Jardine. I wonder, though, that they left me my dispatch case. And that reminds me; I'll want that back. Diplomatic papers, you know."

I told him, very seriously, that we would have to check his credentials. I promised him I would make every effort to locate his secretary and his servants and his coach, took a complete description of all of them, and persuaded him to go into an upstairs room, where I kept him under guard. I did start inquiries, calling in all my informers and spies, but, as I expected, I could learn nothing. I could not find anybody, even, who had seen him anywhere in Perleburg before he appeared at the Sword & Scepter, and that rather surprised me, as somebody should have seen him enter the town, or walk along the street.

In this connection, let me remind your excellency of the discrepancy in the statements of the servant, Franz Bauer, and of the two peasants. The former is certain the man entered the inn yard from the street; the latter are just as positive that he did not. Your excellency, I do not like such puzzles, for I am sure that all three were telling the truth to the best of their knowledge. They are ignorant common folk, I admit, but they should know what they did or did not see.

After I got the prisoner into safekeeping, I fell to examining his papers, and I can assure your excellency that they gave me a shock. I had paid little heed to his ravings about the King of France being dethroned, or about this General Bonaparte who called himself the Emperor Napoleon, but I found all these things mentioned in his papers and dispatches, which had every appearance of being official documents. There was repeated mention of the taking, by the French, of Vienna, last May, and of the capitulation of the Austrian Emperor to

this General Bonaparte, and of battles being fought all over Europe, and I don't know what other fantastic things. Your excellency, I have heard of all sorts of madmen —one believing himself to be the Archangel Gabriel, or Mohammed, or a werewolf, and another convinced that his bones are made of glass, or that he is pursued and tormented by devils—but, so help me God, this is the first time I have heard of a madman who had documentary proof for his delusions! Does your excellency wonder, then, that I want no part of this business?

But the matter of his credentials was even worse. He had papers, sealed with the seal of the British Foreign Office, and to every appearance genuine—but they were signed, as Foreign Minister, by one George Canning, and all the world knows that Lord Castlereagh has been Foreign Minister these last five years. And to cap it all, he had a safe-conduct, sealed with the seal of the Prussian Chancellery—the very seal, for I compared it, under a strong magnifying glass, with one that I knew to be genuine, and they were identical!—and yet, this letter was signed, as Chancellor, not by Count von Berchtenwald, but by Baron Stein, the Minister of Agriculture, and the signature, as far as I could see, appeared to be genuine! This is too much for me, your excellency: I must ask to be excused from dealing with this matter, before I become as mad as my prisoner!

I made arrangements, accordingly, with Colonel Keitel, of the Third Uhlans, to furnish an officer to escort this man into Berlin. The coach in which they come belongs to this police station, and the driver is one of my men. He should be furnished expense money to get back to Perleburg. The guard is a corporal of Uhlans, the orderly of the officer. He will stay with the *Herr Oberleutnant,* and both of them will return here at their own convenience and expense.

I have the honor, your excellency, to be, et cetera, et cetera.

Ernst Hartenstein
Staatspolizeikapitan

(From *Oberleutnant* Rudolf von Tarlburg, to Baron Eugen von Krutz.)

26 November, 1809

Dear Uncle Eugen;

This is in no sense a formal report; I made that at the Ministry, when I turned the Englishman and his papers over to one of your officers—a fellow with red hair and a face like a bulldog. But there are a few things which you should be told, which wouldn't look well in an official report, to let you know just what sort of a rare fish has got into your net.

I had just come in from drilling my platoon, yesterday, when Colonel Keitel's orderly told me that the colonel wanted to see me in his quarters. I found the old fellow in undress in his sitting room, smoking his big pipe.

"Come in, lieutenant; come in and sit down, my boy!" he greeted me, in that bluff, hearty manner which he always adopts with his junior

officers when he has some particularly nasty job to be done. "How would you like to take a little trip in to Berlin? I have an errand, which won't take half an hour, and you can stay as long as you like, just so you're back by Thursday, when your turn comes up for road patrol."

Well, I thought, this is the bait. I waited to see what the hook would look like, saying that it was entirely agreeable with me, and asking what his errand was.

"Well, it isn't for myself, Tarlburg," he said. "It's for this fellow Hartenstein, the *Staatspolizeikapitan* here. He has something he wants done at the Ministry of Police, and I thought of you because I've heard you're related to the Baron von Krutz. You are, aren't you?" he asked, just as though he didn't know all about who all his officers are related to.

"That's right, colonel; the baron is my uncle," I said. "What does Hartenstein want done?"

"Why, he has a prisoner whom he wants taken to Berlin and turned over at the Ministry. All you have to do is to take him in, in a coach, and see he doesn't escape on the way, and get a receipt for him, and for some papers. This is a very important prisoner; I don't think Hartenstein has anybody he can trust to handle him. The prisoner claims to be some sort of a British diplomat, and for all Hartenstein knows, maybe he is. Also, he is a madman."

"A madman?" I echoed.

"Yes, just so. At least, that's what Hartenstein told me. I wanted to know what sort of a madman—there are various kinds of madmen, all of whom must be handled differently—but all Hartenstein would tell me was that he had unrealistic beliefs about the state of affairs in Europe."

"Ha! What diplomat hasn't?" I asked.

Old Keitel gave a laugh, somewhere between the bark of a dog and the croaking of a raven.

"Yes, exactly! The unrealistic beliefs of diplomats are what soldiers die of," he said. "I said as much to Hartenstein, but he wouldn't tell me anything more. He seemed to regret having said even that much. He looked like a man who's seen a particularly terrifying ghost." The old man puffed hard at his famous pipe for a while, blowing smoke through his mustache. "Rudi, Hartenstein has pulled a hot potato out of the ashes, this time, and he wants to toss it to your uncle, before he burns his fingers. I think that's one reason why he got me to furnish an escort for his Englishman. Now, look; you must take this unrealistic diplomat, or this undiplomatic madman, or whatever in blazes he is, in to Berlin. And understand this." He pointed his pipe at me as though it were a pistol. "Your orders are to take him there and turn him over at the Ministry of Police. Nothing has been said about whether you turn him over alive, or dead, or half one and half the other. I know nothing about this business, and want to know nothing; if Harten-

stein wants us to play goal warders for him, then he must be satisfied with our way of doing it!"

Well, to cut short the story, I looked at the coach Hartenstein had placed at my disposal, and I decided to chain the left door shut on the outside, so that it couldn't be opened from within. Then, I would put my prisoner on my left, so that the only way out would be past me. I decided not to carry any weapons which he might be able to snatch from me, so I took off my saber and locked it in the seat box, along with the dispatch case containing the Englishman's papers. It was cold enough to wear a greatcoat in comfort, so I wore mine, and in the right side pocket, where my prisoner couldn't reach, I put a little leaded bludgeon, and also a brace of pocket pistols. Hartenstein was going to furnish me a guard as well as a driver, but I said that I would take a servant, who could act as guard. The servant, of course, was my orderly, old Johann; I gave him my double hunting gun to carry, with a big charge of boar shot in one barrel and an ounce ball in the other.

In addition, I armed myself with a big bottle of cognac. I thought that if I could shoot my prisoner often enough with that, he would give me no trouble.

As it happened, he didn't, and none of my precautions—except the cognac—were needed. The man didn't look like a lunatic to me. He was a rather stout gentleman, of past middle age, with a ruddy complexion and an intelligent face. The only unusual thing about him was his hat, which was a peculiar contraption, looking like a pot. I put him in the carriage, and then offered him a drink out of my bottle, taking one about half as big myself. He smacked his lips over it and said, "Well, that's real brandy; whatever we think of their detestable politics, we can't criticize the French for their liquor." Then, he said, "I'm glad they're sending me in the custody of a military gentleman, instead of a confounded gendarme. Tell me the truth, lieutenant; am I under arrest for anything?"

"Why," I said, "Captain Hartenstein should have told you about that. All I know is that I have orders to take you to the Ministry of Police, in Berlin, and not to let you escape on the way. These orders I will carry out; I hope you don't hold that against me."

He assured me that he did not, and we had another drink on it—I made sure, again, that he got twice as much as I did—and then the coachman cracked his whip and we were off for Berlin.

Now, I thought, I am going to see just what sort of a madman this is, and why Hartenstein is making a State affair out of a squabble at an inn. So I decided to explore his unrealistic beliefs about the state of affairs in Europe.

After guiding the conversation to where I wanted it, I asked him:

"What, *Herr* Bathurst, in your belief, is the real, underlying cause of the present tragic situation in Europe?"

That, I thought, was safe enough.

Name me one year, since the days of Julius Caesar, when the situation in Europe hasn't been tragic! And it worked, to perfection.

"In my belief," says this Englishman, "the whole mess is the result of the victory of the rebellious colonists in North America, and their blasted republic."

Well, you can imagine, that gave me a start. All the world knows that the American Patriots lost their war for independence from England; that their army was shattered, that their leaders were either killed or driven into exile. How many times, when I was a little boy, did I not sit up long past my bedtime, when old Baron von Steuben was a guest at Tarlburg-Schloss, listening open-mouthed and wide-eyed to his stories of that gallant lost struggle! How I used to shiver at his tales of the terrible winter camp, or thrill at the battles, or weep as he told how he held the dying Washington in his arms, and listened to his noble last words, at the Battle of Doylestown! And here, this man was telling me that the Patriots had really won, and set up the republic for which they had fought! I had been prepared for some of what Hartenstein had called unrealistic beliefs, but nothing as fantastic as this.

"I can cut it even finer than that," Bathurst continued. "It was the defeat of Burgoyne at Saratoga. We made a good bargain when we got Benedict Arnold to turn his coat, but we didn't do it soon enough. If he hadn't been on the field that day, Burgoyne would have gone through Gates' army like a hot knife through butter."

But Arnold hadn't been at Saratoga. I know; I have read much of the American War. Arnold was shot dead on New Year's Day of 1776, during the storming of Quebec. And Burgoyne had done just as Bathurst had said; he had gone through Gates like a knife, and down the Hudson to join Howe.

"But, *Herr* Bathurst," I asked, "how could that affect the situation in Europe? America is thousands of miles away, across the ocean."

"Ideas can cross oceans quicker than armies. When Louis XVI decided to come to the aid of the Americans, he doomed himself and his regime. A successful resistance to royal authority in America was all the French Republicans needed to inspire them. Of course, we have Louis's own weakness to blame, too. If he'd given those rascals a whiff of grapeshot, when the mob tried to storm Versailles in 1790, there'd have been no French Revolution."

But he had. When Louis XVI ordered the howitzers turned on the mob at Versailles, and then sent the dragoons to ride down the survivors, the Republican movement had been broken. That had been when Cardinal Talleyrand, who was then merely Bishop of Autun, had come to the fore and become the power that he is today in France; the greatest King's Minister since Richelieu.

"And, after that, Louis's death followed as surely as night after day," Bathurst was saying. "And

because the French had no experience in self-government, their republic was foredoomed. If Bonaparte hadn't seized power, somebody else would have; when the French murdered their king, they delivered themselves to dictatorship. And a dictator, unsupported by the prestige of royalty, has no choice but to lead his people into foreign war, to keep them from turning upon him."

It was like that all the way to Berlin. All these things seem foolish, by daylight, but as I sat in the darkness of that swaying coach, I was almost convinced of the reality of what he told me. I tell you, Uncle Eugen, it was frightening, as though he were giving me a view of Hell. *Gott im Himmel*, the things that man talked of! Armies swarming over Europe; sack and massacre, and cities burning; blockades and starvation; kings deposed, and thrones tumbling like tenpins; battles in which the soldiers of every nation fought, and in which tens of thousands were mowed down like ripe grain; and, over all, the Satanic figure of a little man in a gray coat, who dictated peace to the Austrian Emperor in Schoenbrunn, and carried the Pope away a prisoner to Savona.

Madman, eh? Unrealistic beliefs, says Hartenstein? Well, give me madmen who drool spittle, and foam at the mouth, and shriek obscene blasphemies. But not this pleasant-seeming gentleman who sat beside me and talked of horrors in a quiet, cultured voice, while he drank my cognac.

But not all my cognac! If you, man at the Ministry—the one with red hair and the bulldog face—tells you that I was drunk when I brought in that Englishman, you had better believe him!

Rudi.

(From Count von Berchtenwald, to the British Minister.)

28 November, 1809

Honored Sir:

The accompanying dossier will acquaint you with the problem confronting this Chancellery, without needless repetition on my part. Please to understand that it is not, and never was, any part of the intentions of the government of His Majesty Friedrich Wilhelm III to offer any injury or indignity to the government of His Britannic Majesty George III. We would never contemplate holding in arrest the person, or tampering with the papers, of an accredited envoy of your government. However, we have the gravest doubt, to make a considerable understatement, that this person who calls himself Benjamin Bathurst is any such envoy, and we do not think that it would be any service to the government of His Britannic Majesty to allow an impostor to travel about Europe in the guise of a British diplomatic representative. We certainly should not thank the government of His Britannic Majesty for failing to take steps to deal with some person who, in England, might falsely represent himself to be a Prussian diplomat.

This affair touches us as closely

as it does your own government; this man had in his possession a letter of safe-conduct, which you will find in the accompanying dispatch case. It is of the regular form, as issued by this Chancellery, and is sealed with the Chancellery seal, or with a very exact counterfeit of it. However, it has been signed, as Chancellor of Prussia, with a signature indistinguishable from that of the Baron Stein, who is the present Prussian Minister of Agriculture. Baron Stein was shown the signature, with the rest of the letter covered, and without hesitation acknowledged it for his own writing. However, when the letter was uncovered and shown to him, his surprise and horror were such as would require the pen of a Goethe or a Schiller to describe, and he denied categorically ever having seen the document before.

I have no choice but to believe him. It is impossible to think that a man of Baron Stein's honorable and serious character would be party to the fabrication of a paper of this sort. Even aside from this, I am in the thing as deeply as he; if it is signed with his signature, it is also sealed with my seal, which has not been out of my personal keeping in the ten years that I have been Chancellor here. In fact, the word "impossible" can be used to describe the entire business. It was impossible for the man Benjamin Bathurst to have entered the inn yard—yet he did. It was impossible that he should carry papers of the sort found in his dispatch case, or that such papers should exist—yet I am sending them to you with this letter. It is impossible that Baron von Stein should sign a paper of the sort he did, or that it should be sealed by the Chancellery—yet it bears both Stein's signature and my seal.

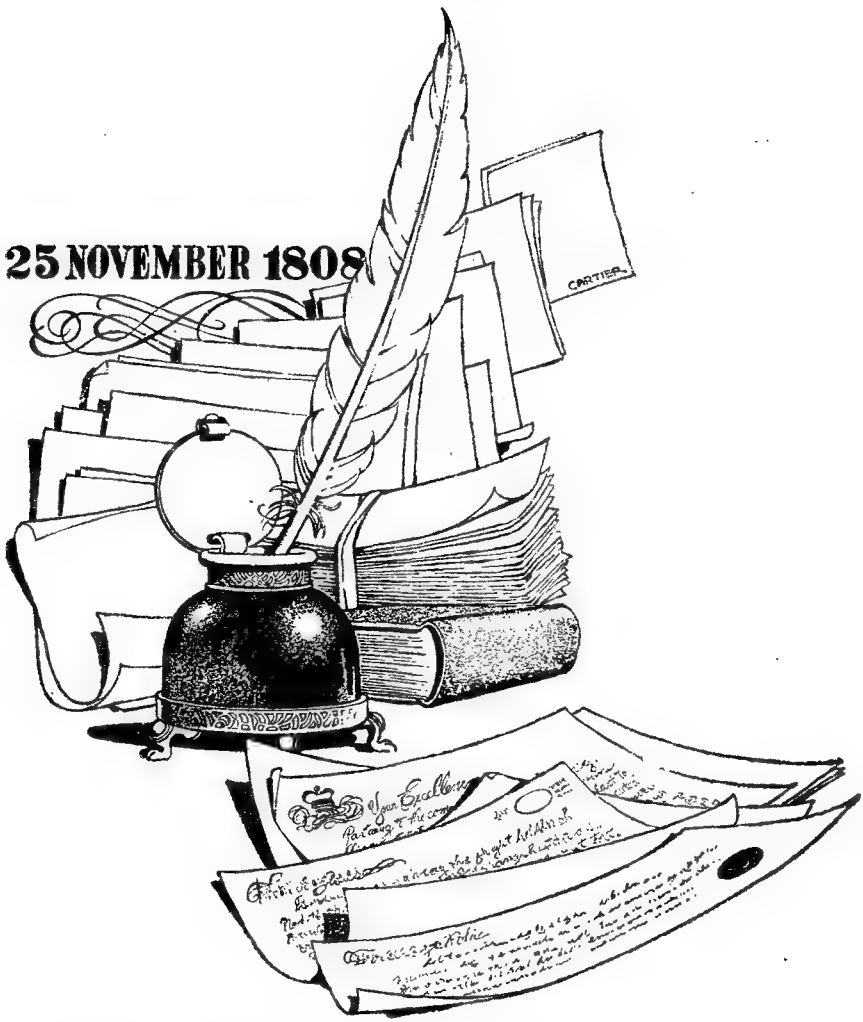
You will also find in the dispatch case other credentials, ostensibly originating with the British Foreign Office, of the same character, being signed by persons having no connection with the Foreign Office, or even with the government, but being sealed with apparently authentic seals. If you send these papers to London, I fancy you will find that they will there create the same situation as that caused here by this letter of safe-conduct.

I am also sending you a charcoal sketch of the person who calls himself Benjamin Bathurst. This portrait was taken without its subject's knowledge. Baron von Krutz's nephew, Lieutenant von Tarlburg, who is the son of our mutual friend Count von Tarlburg, has a little friend, a very clever young lady who is, as you will see, an expert at this sort of work: she was introduced into a room at the Ministry of Police and placed behind a screen, where she could sketch our prisoner's face. If you should send this picture to London, I think that there is a good chance that it might be recognized. I can vouch that it is an excellent likeness.

To tell the truth, we are at our wits' end about this affair. I cannot understand how such excellent imitations of these various seals could be made, and the signature

of the Baron von Stein is the most expert forgery that I have ever seen, in thirty years' experience as a statesman. This would indicate careful and painstaking work on the part of somebody; how, then, do we reconcile this with such clumsy mistakes, recognizable as such by any schoolboy, as signing the name of Baron Stein as Prussian Chancellor, or Mr. George Canning, who is a member of the opposition party and not connected with your government, as British Foreign secretary.

These are mistakes which only a madman would make. There are those who think our prisoner is



mad, because of his apparent delusions about the great conqueror, General Bonaparte, alias the Emperor Napoleon. Madmen have been known to fabricate evidence to support their delusions, it is true, but I shudder to think of a madman having at his disposal the resources to manufacture the papers you will find in this dispatch case. Moreover, some of our foremost medical men, who have specialized in the disorders of the mind, have interviewed this man Bathurst and say that, save for his fixed belief in a nonexistent situation, he is perfectly sane.

Personally, I believe that the whole thing is a gigantic hoax, perpetrated for some hidden and sinister purpose, possibly to create confusion, and to undermine the confidence existing between your government and mine, and to set against one another various persons connected with both governments, or else as a mask for some other conspiratorial activity. Only a few months ago, you will recall, there was a Jacobin plot unmasked at Köln.

But, whatever this business may portend, I do not like it. I want to get to the bottom of it as soon as possible, and I will thank you, my dear sir, and your government, for any assistance you may find possible.

I have the honor, sir, to be, et cetera, et cetera, et cetera,

Berchtenwald

FROM BARON VON KRUTZ, TO THE COUNT VON BERCHTENWALD. MOST URGENT; MOST IMPORTANT. TO BE DELIVERED IMMEDIATELY AND IN PERSON, REGARDLESS OF CIRCUMSTANCES.

28 November, 1809

Count von Berchtenwald:

Within the past half hour, that is, at about eleven o'clock tonight, the man calling himself Benjamin Bathurst was shot and killed by a sentry at the Ministry of Police, while attempting to escape from custody.

A sentry on duty in the rear courtyard of the Ministry observed a man attempting to leave the building in a suspicious and furtive manner. This sentry, who was under the strictest orders to allow no one to enter or leave without written authorization, challenged him; when he attempted to run, the sentry fired his musket at him, bringing him down. At the shot, the Sergeant of the Guard rushed into the courtyard with his detail, and the man whom the sentry had shot was found to be the Englishman, Benjamin Bathurst. He had been hit in the chest with an ounce ball, and died before the doctor could arrive, and without recoverng consciousness.

An investigation revealed that the prisoner, who was confined on the third floor of the building, had fashioned a rope from his bedding, his bed cord, and the leather strap of his bell pull. This rope was only long enough to reach to the window of the office on the second floor, directly below, but he managed to

enter this by kicking the glass out of the window. I am trying to find out how he could do this without being heard. I can assure you that somebody is going to smart for this night's work. As for the sentry, he acted within his orders; I have commended him for doing his duty, and for good shooting, and I assume full responsibility for the death of the prisoner at his hands.

I have no idea why the self-so-called Benjamin Bathurst, who, until now, was well-behaved and seemed to take his confinement philosophically, should suddenly make this rash and fatal attempt, unless it was because of those infernal dunderheads of madhouse doctors who have been bothering him. Only this afternoon they deliberately handed him a bundle of newspapers—Prussian, Austrian, French, and English—all dated within the last month. They wanted, they said, to see how he would react. Well, God pardon them, they've found out!

What do you think should be done about giving the body burial?

Krutz

(From the British Minister, to the Count von Berchtenwald.)

December 20th, 1809

My dear Count von Berchtenwald:

Reply from London to my letter of the 28th, which accompanied the dispatch case and the other papers, has finally come to hand. The papers which you wanted returned—the copies of the statements taken at Perleburg, the letter to the Baron von Krutz from the police captain, Hartenstein, and the personal letter of Krutz's nephew, Lieutenant von Tarlburg, and the letter of safe-conduct found in the dispatch case—accompany herewith. I don't know what the people at Whitehall did with the other papers; tossed them into the nearest fire, for my guess. Were I in your place, that's where the papers I am returning would go.

I have heard nothing, yet, from my dispatch of the 29th concerning the death of the man who called himself Benjamin Bathurst, but I doubt very much if any official notice will ever be taken of it. Your government had a perfect right to detain the fellow, and, that being the case, he attempted to escape at his own risk. After all, sentries are not required to carry loaded muskets in order to discourage them from putting their hands in their pockets.

To hazard a purely unofficial opinion, I should not imagine that London is very much dissatisfied with this dénouement. His Majesty's government are a hard-headed and matter-of-fact set of gentry who do not relish mysteries, least of all mysteries whose solution may be more disturbing than the original problem.

This is entirely confidential, but those papers which were in that dispatch case kicked up the devil's own row in London, with half the government bigwigs protesting their innocence to high Heaven, and the rest accusing one another of complicity in the hoax. If that was somebody's intention, it was liter-

ally a howling success. For a while, it was even feared that there would be questions in Parliament, but eventually, the whole vexatious business was hushed.

You may tell Count Tarlburg's son that his little friend is a most talented young lady; her sketch was highly commended by no less an authority than Sir Thomas Lawrence, and here comes the most bedeviling part of a thoroughly bedeviled business. The picture was instantly recognized. It is a very fair likeness of Benjamin Bathurst, or, I should say, Sir Benjamin Bathurst, who is King's lieutenant governor for the Crown Colony of Georgia. As Sir Thomas Lawrence did his portrait a few years back, he is in an excellent position to criticize the work of Lieutenant von Tarlburg's young lady. However, Sir Benjamin Bathurst was known to have been in Savannah, attending to the duties of his office, and in the pubilc eye, all the while that his double was in Prussia. Sir Benjamin does not have a twin brother. It has been suggested that this fellow might be a half-brother, but, as far as I know, there is no justification for this theory.

The General Bonaparte, alias the Emperor Napoleon, who is given so much mention in the dispatches, seems also to have a counterpart in actual life; there is, in the French army, a Colonel of Artillery by that name, a Corsican who Gallicized his original name of Napolione Buonaparte. He is a most brilliant military theoretician; I am sure some of your own officers, like General Scharnhorst, could tell you about him. His loyalty to the French monarchy has never been questioned.

This same correspondence to fact seems to crop up everywhere in that amazing collection of pseudo-dispatches and pseudo-State papers. The United States of America, you will recall, was the style by which the rebellious colonies referred to themselves, in the Declaration of Philadelphia. The James Madison who is mentioned as the current President of the United States is now living, in exile, in Switzerland. His alleged predecessor in office, Thomas Jefferson, was the author of the rebel Declaration; after the defeat of the rebels, he esecaped to Havana, and died, several years ago, in the Principality of Lichtenstein.

I was quite amused to find our old friend Cardinal Talleyrand—without the ecclesiastical title—cast in the role of chief adviser to the usurper, Bonaparte. His Eminence, I have always thought, is the sort of fellow who would land on his feet on top of any heap, and who would as little scruple to be Prime Minister to His Satanic Majesty as to His Most Christian Majesty.

I was baffled, however, by one name, frequently mentioned in those fantastic papers. This was the English general, Wellington. I haven't the least idea who this person might be.

I have the honor, your excellency, et cetera, et cetera, et cetera.

Sir Arthur Wellesley

THE END.

BY A. BERTRAM CHANDLER

NEW WINGS

Illustrated by Pat Davis

It's "any port in a storm," but if the port's too harsh, the refugees may never quite get the courage to try again for another port—

It was an hour before sunrise.

The sky was black, the stars were very bright. And there were two moons—one, high in the east, climbing the last few degrees of arc to the meridian, the other lifting rapidly from the western horizon. The reflected light of the satellites glittered from tiny crystals in the rocks, in the sand. They looked like frost, but they were not. Frost was found only in the immediate vicinity of the canals.

Low on the northern horizon glimmered the dim lights of the city. They hung there, between the dark, featureless desert and the black, star-scintillant sky, a reproach, eloquent witness to the carelessness of the man who should have switched them off on leaving. They were wasting precious power. For all the people of the city were here, out in the desert. Dim, amorphous shapes they were, huddled in their thick clothing, their oxygen helmets

making their heads look abnormally large. They were staring up at what seemed to be a tower. From the rounded top of it, perhaps a thousand feet uplifted in the thin air, polished glass threw back the shifting light of the two moons. At its base were what looked like four huge buttresses, one of them badly crumpled.

The Morning Star came up in the east, blazing brightly and ruddily. And in its wake came the first, faint flush of dawn. The people turned to stare at the luridly effulgent planet. There was a low, faint muttering.

Another star, shining whitely, not so bright, lifted over the undulations of the desert horizon. It was Venus. Then the sun came up. The burnished metal of the tower blazed dazzingly in the level light of the first rays. Some of the people shielded their eyes. A door opened in the side of the tower, well up, above the buttresses. The Keeper of the Ship stood in the doorway. He slowly raised his right hand in salutation to the people.

It was the Morning of the Anniversary.

The Keeper of the Ship spoke. His voice was muffled by his helmet, faint in the attenuated air. Had it not been for the microphone, the amplifiers, the battery of loudspeakers, he would have been inaudible to all save the front ranks of the people. But his voice, with its mechanical aids, was loud enough, was heard by all. It was loud enough—yet had the quality of a faint, hopeless sigh. And the response of the people to his words was also a sighing, fainter still, yet penetrating, burdened with a tragedy such as the long, bloody ages of Man's history had never before known. The poet, the poor, incompetent rhymester who had come with Calvin, would have thought far more highly of his halting verses had he lived to hear, to know, the feeling with which they were infused on the occasions of this annual ceremony.

The Keeper of the Ship was not concerned with rhyme or rhythm, with that elusive, indefinable something called beauty. He was the Keeper of the Ship, the guardian of tradition, the warden of all that remained of the world that once men had called Home. Consciously histrionic, he spread his arms and intoned:

"And men were happy then, they say,
Could breath and drink their fill, and play
Through soft, warm night and cloudy day—"

"Long, long ago, and far away—" came the sighing response.

And some of the people turned their heads to look at the bright Morning Star, still visible even now, with the sun degrees above the horizon. An observer would have found it hard to see the expression on their faces; the transparency of their helmets reflected the light as they turned and stared towards the east. But a hopeless, helpless longing was evident in every line of their bodies. It was a longing for Paradise Lost—lost and never to be

regained. Paradise that was, perhaps, all the more desirable for being only a legend, only a tale of a world that once was, handed down from father to son, down the exiled generations.

"But though men's feet were softly shod
And bright and fair the path they trod,
They lusted for the power of God—"

"Long, long ago, and far away—"

And Jennifer, pressing against her tall, dark, hungry-looking husband, whispered: "I often wonder if they *were* as happy as we're always told—"

Greg growled in reply: "They could at least be miserable in comfort!"

"From cloudless skies the rockets came,
The Cities withered in the flame—"

"Long, long ago, and far away—"

"The kindled blaze roared high and higher,
The Peoples perished in the fire—"

"Long, long ago, and far away—"

Greg said, not very softly: "Lucky buggers. They died warm!"

There were subdued cries of "Quiet!"

"The storm-rent air, the boiling sea
Burned, and there was no place to flee—"

"Long ago, and far away—"

Whispered Greg: "A nice, corny way of saying that there was a hydrogen atom chain reaction—"

"Please, Greg, be quiet," pleaded Jennifer. "You're spoiling it all—"

And Greg looked down at his wife's face, at the riot of blond curls confined in the transparent helmet—and at the suspicion of moisture in the eyes that returned his stare.

Poor kid, he thought, *she takes this Mumbo Jumbo seriously.* Then, bitterly. *But what else is there? Long live the Human Race. We've got a great future behind us!*

"But there was Calvin and his Ship
The Chosen Few to Make the Trip—"

"What a bloody pity there wasn't a real poet among 'em!"

"Greg! *Please!*"

"Long, long ago, and far away—"

"On shafts of flame, on wings of light,
They lifted through the Judgment Night—"

"Long, long ago, and far away—"

"And we, among these deserts red—"
"(The Ship is broken, Calvin dead,
The Secret lost, all Knowledge fled . . .)"
"Are here to stay, are here to stay . . ."

"And thank whatever gods there be that that's over for another year!" growled Greg gratefully. "There were giants in those days—sure. But we'd be better employed in trying to add a few inches to our own stature than in harking back to the past every Anniversary—and all the days between!"

Jennifer started to reply, but she was interrupted. It was a tall girl who had been standing next to them. She was fully as tall as Greg, and she was dark, and her face had

a peculiarly silly kind of prettiness. It could have been the end result of generations of inbreeding. And—

"Isn't he *awful,* Jenny?" she said.

"I don't know," replied Jennifer, rallying half-heartedly to the defense of her husband. "A lot of what Greg says is right. Perhaps we do waste too much time in hankering after the past. But"—and her sweeping gesture encompassed the sterile desert, the almost black sky with, in broad daylight, a few faint stars at the zenith, the humped, unlovely hemisphere of the city on the northern horizon—"this is not Home. It never was. It never will be."

"And what would *you* give us instead, Greg?" demanded the short, dark man who was husband to the tall, dark girl.

"That!"

Greg pointed. He pointed to the east. Had the line of his outstretched arm been produced it would never have reached Earth, hanging ruddily in the dark sky a few degrees above the sun. It would have reached that other paler, fainter point of light below it.

"That!" said Greg again. "We still have the Ship, Warren. There are books in the Ship—although we are never allowed to see them. If her engines aren't in working order, it should not be hard, given the books, the tools, to put them right. And *there,* Warren, is air. A good, rich, thick atmosphere. And there's water. And there may be life, hostile—but it'll give us something better to fight than cold, and hunger, and slow asphyxiation. Because it's a losing battle. We all know that it's a losing battle here on Mars. We run our compressors twenty-four hours out of the twenty-four to maintain a breathable atmosphere inside the dome. And when they break down—as they have broken down—the life of the entire race is in the hands of a few technicians. Just as our lives are in the hands of the gardener. We are utterly dependent upon his ability to cope with the mutating viruses that attack, time after time again, the carbon-dioxide-hungry weeds that are our air-conditioning plant. And the rest of us, working always in the fields, are fighting all the time. There are the virus diseases of our grain. There are the desert rats. There are our radiant heat projectors, and their continual drain on the power reserves of the community.

"And we can't develop. We can't get anywhere. It's a hand-to-mouth existence, and our culture is completely static—or, worse, retrogressive. The struggle for existence takes all our time."

"So it would there—" said Warren.

"Perhaps. For a generation, or two generations. We'd have to make ourselves safe against hostile life-forms. But we should not have to fight for every mouthful of water, every lungful of air—"

"Slow down a bit," said Warren. "Today's a holiday. We've earned it—the one holiday of all the year. We're in no hurry to get back to the stale, canned air of the city."

The four of them, the two men and the two girls, slackened their pace. The rest of the people overtook them, streamed past them. And in a short time the mile or so between themselves and the Ship was a mere, empty expanse of sand, and there was at least a quarter mile between them and the rearguard of the homeward hurrying citizens.

"Now we can talk," said Warren. His face, fat and dark inside the spherical transparency of his helmet, was that of some child in its comic seriousness. "Now we can talk." The simple words were transformed into a child's conspiratorial whisper. "You don't like the Council, Greg. Neither do I. Neither does Ruth, here. And you, Jennifer?"

She replied, speaking slowly, weighing her words: "No. I don't. They made my brother an outcast. They put him Outside with only the food in his pouch, only the air in his helmet tanks. And it was because he was seeking for the secret of atomic power—for light, and heat, and life for us all."

"And Death, maybe."

"What of it? A swift, clean death if the power gets out of hand again is better than this long, slow drift into racial senescence, into the age when we shall be no more than savages with distorted memories of the power and the glory that once were ours." She quoted bitterly:

"'And though men's feet were softly shod,
And bright and fair the path they trod,
They lusted for the power of God—'"

"But they were *Men*."

"Sure, 'sure," Greg soothed her. "There were giants in those days!"

"So," mused Warren, "there's you, Greg, wants to push off for the stars again. There's Jenny a-hankering after the departed glories of the race. Ruth and me—we're ag'in the government, too. Just on principle, perhaps. But we feel that the Council is wrong in not letting us, and people like us, loose among the secrets of the Ship. It could mean so much in comfort, in a vastly higher standard of living. And if the experimenters should be careless, should start the same hydrogen atom chain reaction that wiped out Earth, well"—he grinned, and snapped his fingers—"there goes nothing."

"You say there are more of you?" snapped Greg. "Us—" he amended.

"Why, yes. Where *have* you been living? There are at least fifty. And there are seven hundred people, of all ages, in the city. And there are twelve old fossils in the Council. Their police force numbers thirty-five. That leaves, say, six hundred innocent bystanders. Six hundred who will, perhaps, back the Council out of sheer force of habit. Six hundred who will swing their allegiance to anybody who will promise them better living conditions—"

Greg frowned. But the odds weren't too discouraging. He had managed, in what should have been his sleep periods, to study history—and he knew that a determined, ruthless minority, knowing what it wanted, had more than once seized

power. At the time of the Reichstag fire the membership of the Nazi party had passed its peak—and, ranged against Communists, Catholics, Social Democrats, the Brown Shirts were greatly outnumbered. So, in 1917, were the Bolsheviki—

Ruth said, the steeliness of her voice belying the pretty vacuity of her face: "We want the Ship."

Said Warren, his face that of a very determined boy: "And you shall have it, my dear." And then, just before the four rebels overhauled the stragglers on the pathway through the slender-stalked, shoulder-high corn, the strip of human tillage along the bank of the immemorably old canal: "Don't forget. Tonight at seventeen hundred, at Ruth's apartment."

In the beginning, in the first few years after the coming of Man—not as a conqueror but as a fugitive—to Mars, the Anniversary had been a day of thanksgiving. The few survivors of the Atomic War were humble and grateful—although, perhaps, their very humbleness held a peculiar undertone of pride. For they had been spared. Out of all Earth's millions, *they* had been spared.

And their salvation had not been without its element of chance. Calvin—dimly foreseeing the results of the use of the new lithium hydride bombs—had built his Ship, his Ark. He had intended to save only those who would be of use in building a new civilization beyond the sky. But the war had come so quickly, had achieved utter dislocation of communications so incredibly fast, that, even before the beginning of the hydrogen atom disintegration, it had been impossible for him to man his Ship as he had desired. So it was that he had blasted off with a crew not of technicians and scientists, but of men and women picked at random from the hordes of refugees that were congesting all the roads from all the cities. There was even, among their number, a producer of verses for greeting cards.

He had been a kindly man, this Calvin. He had not had the heart to tell those whom he had snatched from the holocaust of what his real plans had been, of their miscarriage. Had he lived among them long, in the domed city that he, himself, had designed, it is probable that he would have told them. But he lived only two Martian years after the landing—the unexpectedly violent setting down that had seriously injured him, from which injuries he had never fully recovered, that had killed three women and four men among his passengers.

And so the people had lived on without Calvin, had lived and bred and fought a coldly hostile Nature for the bare essentials of existence. The seed grain that had been in Calvin's stores had flourished—after a fashion. It had grown tall and sickly, and with every passing year its yield was less. The turbo-generators that he had fashioned dragged a trickle of electric power from the sluggish, uncertain flow of the canal.

But the atomic power, the power unlimited that slumbered in the ship's engine room, they dare not touch. They were burnt children—Perhaps it was fear that prevented them from smashing the already damaged engines. But it was not fear that stopped them from burning the technical books. A man will go cleanshaven from adolescence to the grave—but offer him a safe, permanent depilatory and he will not dream of accepting it. He will not deliberately cut himself off from the power to grow a beard should he so desire. So it was with the Chosen People.

Yes—that is what they called themselves. But it was an empty sort of self-awarded honor. For all around them was the evidence that they were not the first, that another, older race had fought, with mighty weapons, the cold, the red dust sweeping in from the desert. The canals they had left—and Earth's survivors used but one of them. And ruins they had left—fantastically fretted towers that were uncovered as the dunes marched before the thin, insistent winds, that were covered again long before any thorough investigation could be made. And, in any case, there was no will to investigate.

Something had died in the people.

Something had died when Earth died. It was the urge to experiment, to explore, the "lust of knowing what should not be known." Men were no longer "unwise and curiously planned." And until this time, generations after the landing, when the old, adventurous spirit of Man was making a reappearance, they were not men—

And so it was the people of the city watched the scratched old films, heard the old music, the old poetry, with mixed feelings. Some were there who regarded this display of the ancient arts as a peak from which the race had long since fallen, never to climb again. And there were some who saw only peril and ultimate doom in the work of the adventurous minds on this day displayed. It was adventure, curiosity, call it what you will, that had ended the world, had all but ended the race. And there were some, still a minority, to whom the pictures and the poetry, symphony and sonnet, were but a signpost pointing not to the past but to the future.

And to them, to this minority, the Anniversary was well worth while. It was more than a day's break from the endless, dreary routine of tillage and irrigation, of cold, bitter seed time and scanty harvest, of the unending struggle with the small, savagely cunning pests and the ever-drifting dunes. It was more than a holiday from the drudgery of eternal machine minding, from the toil of ever more frequent repairs made with worn out tools.

It was a vision of the glory to be.

And when they met in Ruth's apartment some of the members of this minority bore on their faces the badge of their kind. It was Hope—and hope not altogether impossible, illogical.

Warren was there, with Ruth, and together they rode the tide of faith

before it had time to ebb. He and the girl produced a bottle of the crude whiskey that was distilled, illegally but with the connivance of the Council, from the precious grain. Glasses and mugs were filled. Those present—there were twenty or so packed into the room—were about to drink, when Greg stopped them. He raised his hand in a demand for silence. And he said:

"It's your whiskey, Warren. Or Ruth's. But I think that we should have a toast."

"A toast?" The little man's baby face was screwed into an expression of sullen impatience. It cleared, but the eyes were still sullen. "A toast? Very well then, Greg. You propose it."

Greg raised his glass. He looked at Jennifer. She said doubtfully: "There were giants—?"

"No! That's the past. We hear too much about the past. It's a weight dragging us down—but it should be wings to lift us. Wings." he repeated. "Wings. Here's my toast, Warren!

"New wings!"

Warren drained his glass. "So be it. And now—"

Ruth had opened a locker in the wall. She took out weapons—knives, clubs, a Tommy-gun. "One of the police was careless," she explained. "This was officially lost in the desert—"

"But what—?" began Greg.

"We're taking the Ship. We want you—or, rather, we want Jennifer. We knew that we couldn't have one without the other."

"Me?" gasped the girl.

"Yes, you. You were helping your brother with his experiments. It was only your age and sex that saved you from his fate. You'll be some use in the Ship's engine room."

"And why not?" shouted Greg. "Why not, Jenny? We've nothing to lose." He swept his arms upwards. "We have everything to gain!"

"Then you're with us? Good. Take your choice of weapons, Greg—a knife or a club? Hide it under your furs." Warren looked at the clock on the wall of the apartment. "Let's get going!" And he picked up the Tommy-gun, thrust it under his furs, arranged the heavy garments so as to give the maximum concealment.

"But—" Jennifer was stammering. "But—"

"But it's our chance!" shouted Greg. "Give her another whiskey, Ruth!"

The walls of the cells in the human beehive were soundproof. The uproar in Ruth's apartment had attracted no attention. If any muffled noises had drifted out into the corridor, they would, if heard by the patrol, be put down as coming from yet another drunken Anniversary party.

In any case, the corridor was deserted when the score of young people tumbled out through Ruth's door. Deserted, that is, until other doors opened and more young men and women joined Warren's party.

"It's all right," he explained to Greg and Jennifer. "They're all with us."

And so, along the corridors and down ramps, they made their way to the air lock. They attracted the notice of passers-by. They were the target for censorious glances. Had it not been the night of the Anniversary they would surely have been arrested.

But, unmolested, they reached the air lock.

The guard on duty was sullen. He sniffed audibly.

"Drinking!" he said. And: "What do you want?"

"Jusht a moonlight stroll, officer. Jusht a walk under the two luvverly moonsh. S'more than the poor old buggers had way back on Earth—"

"So it's a moonlight stroll you want? I suppose you realize, young Warren, that every time I let anybody out we lose about a thousand cubic feet of air—"

"But it'sh Anniversharv night, Bill ol' man." He assumed the cunning as well as the slurred diction of the drunkard. "An' we brought you your Anniversharv drink."

A bottle changed hands.

"Oh, all right. Seeing that it's the Anniversary. You've all got your helmets? Let's see them on you all first. That's better. Now—into the chamber with you all!"

"*That* was easy," said Warren, as they all stood under and outside the huge dome that was the city. "That was easy. I hope the rest won't be too hard!"

Nor was it.

There were a half dozen guards on duty at the Ship—and they had not forgotten to pour into themselves their Anniversary libations. There was, it is true, some firing. Curiously thin and sharp, almost tinkling, the stammering song of the guards' automatic weapons was answered by the accurate bullets from Warren's gun. And there was a hand-to-hand struggle, and the last men alive found that Man was a fighting animal. The shifting light of the moons gleamed on uplifted knife, cast on to the sand the black shadow of upraised club. And black on the sand, briefly black on the thirsty sand, soaking down, evaporated, before it had time to freeze, was the first blood spilled in anger for generations.

And there was the fumbling at the air lock of the ship, the opening, at last, of the outer and inner doors, the discovery of the Keeper, an old man, drunk, sitting in the light and warmth of his alcohol lamp in what had been the captain's cabin. He fumbled in the captain's desk for the automatic pistol that was there. And Warren shot him.

Warren swung around to face his men—and women—still holding, carelessly, the smoking gun. His pudgy face was a killer's face, and his eyes were ablaze with fanaticism. The index finger of his right hand tightened on the trigger of his weapon. It seemed that it would tighten until he spat his stream of lethal lead at his followers.

But, and barely in time, it relaxed.

"It was wonderful," said Warren. "To fight again, after all these centuries. To fight—and kill. It was—"

Greg cut in—his voice cold water upon a hot body.

"What now, Warren?"

"What now? What—" The blood-drunken face sobered. The feral light died in the eyes. "Oh, yes. The engine room. Jenny, will you go down to the engine room? It's right aft, I think. See if you can get things fixed, will you?"

Greg went down with her, Greg and two or three more of the raiding party. And they looked, uncomprehending, at the mechanical complexity that was there displayed. For, all except Jennifer, were agriculturalists and knew machinery only as it affected their well-being, only as a noise in the background whose sudden cessation could mean discomfort or even danger.

But the girl was one of the machine minders of the city. She had worked on the few, poor machines that were the heart and lungs of the city. She had read the books—both those essential to her job and those that had been smuggled by somebody from the Ship to the city. And there was no real complexity. From the viewpoint of everyday mechanics the most complicated thing there was the little Diesel generator that supplied emergency light and power. Its fuel tank was full, as was the tank of the even smaller petrol motor that would start the Diesel job. As for the rest—it was straightforward atomic power and reaction drive. Mechanically—it could all have been constructed by a reasonably competent plumber. And, after years of intensive study, a genius would have been able to grasp the mathematics of it all.

Jennifer swung over the starting handle of the petrol motor. The machine coughed once or twice, it barked—and it started. Then the Diesel took hold. Automatically the petrol motor cut out. All through the ship the lights came on. There was a clatter as Greg dropped his electric torch to the deck. He said, in a tone of great conviction: "I shan't be needing this again."

There was the sound of heavily shod feet scrambling down the ladder from aloft. It was Warren. He burst into the compartment.

"Ready?" he cried. "Ready?"

"No," replied Jennifer quietly. "No. Not yet." She was pulling down from their lockers piles of old books, was poring over them with a puzzled furrow between her eyes.

Warren said abruptly: "Just as well. I've work to do yet. And don't turn anything loose without giving me warning. I shall be under the drive."

"Under the drive?"

"Yes. Of course. There'll be the relief guards out from the city at any time—and we may as well take advantage of the cover of the vanes."

"Wouldn't you be safer inside—?" began Greg.

But the other was gone, clattering up the ladder.

And Jennifer said, that worried frown intensified: "I don't trust him—"

But, in her work, she soon forgot

her distrust of Warren. Greg could not forget what she said, however, for he could not long maintain an interest in the unintelligible things that she was doing, and his mind was free to wander. He had the Ship—but, in his dreams, possession of the Ship had not entailed this turning of wheels and adjustment of levers, the ends of whose spindles and shafts were out of sight behind thick screens. The muttered talk of critical mass, of controlled chain reaction, rang but faint bells in his mind. He was bored, and he was worried.

Warren, or his like, had never been featured in the mad, splendid dreams about the Ship.

He said, curtly. "I'm going up top."

He climbed the long ladders from the engine room, passed through storerooms and accommodation, through the captain's quarters in which the Keeper of the Ship lay sprawled in untidy and ungainly death. He found his way into Control. He sat in the seat before the big bank of switches and levers and instruments of all kinds. The soft padding yielded to the curves of his body. He was at home.

And everything, gauges and meters and controls, was neatly labeled. And there were books a-plenty, and the mathematics in them was not the esoteric probing into the secrets of matter and energy with which Jennifer was having to cope. It made sense, even to his relatively untutored mind. And

there were the ephemerae with the aid of which Calvin had navigated the ship from Earth to Mars. They, now, would be useless. But it didn't matter. If all went well below, he would have unlimited power under his feet. Venus was too bright, too conspicuous, to miss. And this ship of Calvin's was not one of the early experimental rockets, dependent for its drive upon a limited supply of chemical fuel.

Hesitantly at first, then with increasing confidence, he checked his meters and gauges. *Acceleration*—Zero. *Air Pressure*—One Atmosphere. *I don't need this any more,* he thought, and removed his helmet, threw it carelessly to the deck. *Water*—Ten Tons. Not much—but the Ship in flight, in Space, provided that her purifier worked, would be a closed economy. *Food*—But there was, of course, no gauge or meter for that. He had heard somewhere that none of the provisions remaining in the Ship at her landing had been used, that her storerooms had always been regarded by the Council as a handy reserve against time of famine. He hoped that this was so.

There was a telephone before him. He picked it up, moved the selector switch to ENGINE ROOM. He turned the handle rapidly, heard the high pitched calling squeal.

"Captain to Chief Engineer," he said, as soon as he heard the instrument at the other end being lifted from its rest. He did not have to try very hard to make his voice sound important. "Captain to Chief Engineer. How long before I can have power?"

Jennifer's voice, when she answered, was frightened.

"Captain?" she gasped. "Cap . . .?" Then— "Oh, it's *you.* I thought— For a moment I thought— But it doesn't matter. I'll have power for you in a few minutes now."

A few minutes—

Greg's hands went out, with a caressing motion, to the control bank before him.

A few minutes—

He forced himself to relax, to sink back into the soft, resilient padding of the chair. He looked out through the big viewports, to the dark desert, at the creeping black shadows of the dunes cast by the shifting light of the moons. He looked to the lights of the city, to the north. And he saw, midway between Ship and city, the string of tiny sparks, twisting, turning, ever approaching, that was the electric torches of the relief guard. He thought: *I'm high. I'll be seeing these before Warren will. I'd better warn him.*

He picked up the telephone, put through a call to the air lock. There was nobody there. He frowned, forgetting for the moment that he was not yet—perhaps never would be—captain of the Ship in actuality. Reluctantly, he heaved himself out of his seat, put on the helmet that he had discarded and began the descent of the long ladders.

The inner door opened to his touch, closed behind him. He did not wait for pressure to equalize before opening the outer door. The rush of rapidly expanding air almost blew him out through the doorway. But he kept his feet, swung himself out, scrambled rapidly down the ladder.

Warren and his people—about a dozen of them—were busy. They had scooped a big hollow under the ship, between the vanes, directly under the orifice of the main drive. At first Greg, remembering his historical reading, thought that this was a foxhole, a trench, from which the rebels would fight off the guard. But he was puzzled when he saw the gleam of moonlight on cans, fertilizer cans, that were being stacked in the hollow.

He started forward, a question ready on his lips, the real purpose of his leaving the Ship forgotten. A dark figure detached itself from the main body of the workers, came to meet him. As it got closer he saw that it was Ruth.

"Who is it?" she shouted, her voice thin in the thin air. "What do you want?"

"It's me, Greg. What—?"

Ruth was up to him now, was pressing against him. Their helmets were almost touching. She spoke in a tense whisper.

"I can't go on with it. I can't, I tell you! You'll have to stop them!"

"Who? What?"

"Warren. The Sons of the Judgment—"

"The Sons—"

"Yes. You must stop them. Now." She quoted a verse of poetry:

"Our fathers sinned, they did not stay
To face the fires of Judgment Day,
We pay the debt they did not pay—
Long, long ago, and far away—"

Her voice took on a note of pride. "That is *our* ending to the Anniversary Hymn. I wrote it."

"What *is* this nonsense?" demanded the man.

"It's not nonsense. Do you know what's in those cans? Do you? *Do you?*"

Her voice was becoming hysterical. Greg took hold of her and shook her. Had it not been for her helmet he would have slapped her face.

"What *is* in them, then?"

"Warren is more than our leader. He is our chemist. And, in charge of the fertilizer plant, he has been able to make far more than chemical manures. He has made"—and her voice dropped again to a tense whisper—*"lithium hydride."*

Greg shuddered.

Lithium hydride—the ultimate in atomic explosives. Lithium hydride—awaiting only the solar heat of the primer. Lithium hyride—and the hydrogen atom chain reaction that would follow upon its detonation, spreading through the hydrides and hydrates in the sand, flashing along the blazing waters of the canals. And the primer? The trickle of power that would come from the jets of the Ship

when Jennifer warmed up the drive.

He turned away from Ruth, from the frightened, defiant face of the girl. He looked up at the Ship, and the gleaming, metallic tower that was a finger pointing the way to the stars, that was an arm reaching out for the stars. He looked at the stacked cans beneath her drive, dull-gleaming, innocent seeming, the last word in deadliness. And he knew, without more than the merest smattering of chemistry or physics, that the Ship could never survive the blast.

The death of the Ship would be worse than the death of a world. The clean, fiery death that would flash over Mars would be no more than the anticipation of the inevitable, no more than a hastening of the coming of the doom into which the senile planet was slowly and surely falling.

But with the Ship would go Hope.

The girl was carrying a Tommy-gun. He snatched it from her. For a few seconds they struggled in the shadow of the Ship. She had wanted him to save a world, to save the Ship and the race, to save her own life—but, with the curious illogic of the female, she had thought that it could be accomplished without harm to her lover.

Greg, realizing that this was the only way, struck Ruth across the chest with the butt of the gun. She sank to the ground, moaning. Then she started to scream. But her cries, muffled by her helmet, thin in the thin air, were not heard by Warren and his party.

Greg left her huddled on the sand. He strode toward the shadowy figures still working in the shadow of the vanes. He shouted: "I've got you covered. Get that stuff away from under the Ship!"

Warren heard. The men and women with him heard. Cans dropped upon cans with a dull clatter. Weapons were snatched up. The brittle music of the guns was Warren's requiem. But Warren was only one of many.

It was a good fight while it lasted. Men—and women—learned anew the value of cover, the art of concealment. For a while it was hide and seek around the great vanes. Greg, in a perverse kind of way, was enjoying it. He enjoyed it until he found that, when he snatched the gun from Ruth, he had not thought to take any spare ammunition or box magazines that she might have had on her person.

He had fired his last burst, and he was only a hundred feet from the foot of the ladder running up to the air lock. He thought that he might make it without being more than wounded. He doubted that he would be able to get up the ladder. But he would have to try. The vane behind which he was crouching gave him protection from one side only. A cautious muzzle poked around the edge of the vane that he was facing, and a badly aimed burst left streaks of

silvery lead all along the hard metal of the one at his back.

He tensed himself for the dash.

He was about to spring—then dropped suddenly to his face. The warning that he had left the Ship to give had never been given, the relief guards were here. Greg, taking his attention momentarily from the grim game being played around the Ship, had seen, in time, the flashing of torches behind the dunes, the glint of moonlight on metal. He thought, too, that he heard the order to fire given—but in that he may have been mistaken. But he dropped to his face. And, from all sides, the leaden hail drove in upon the Ship.

His enemies dropped too—but they dropped too late.

From all sides the guards converged upon the ship. They found the bodies of their comrades. They found the bodies of Warren and his people. One was not yet dead, was threshing the sand with feeble arms. The police officer gave a sharp order. And a knife flashed up, and then down.

Greg's intention had been to get to his feet, to explain the circumstances to the police. But now he dared not. And he lay there and sweated. He was badly frightened—not so much for himself as for his dream.

Somebody, a woman, was calling from the air lock.

"Warren! Warren!" Then: "Greg! Greg!"

Guns were leveled, but not fired. The officer shouted: "Not so fast, there. We have to take some prisoners. The Council must have somebody alive to help get to the bottom of this mess!"

"Ruth!" shouted Greg. "Shut that door. Tell Jenny to turn on the drive after thirty minutes unless I tell her not to! I'll hammer on the door if I want to get in. Make sure it is me—and alone!"

"Get that man!" bellowed the officer. "Alive, you fools!"

Greg got to his feet.

He called: "Here I am. And you'd better handle me with kid gloves."

The officer swaggered up, his gun at the ready.

"We'll handle you with kid gloves, all right. But you'll be going out into the desert with only the air in your helmet tanks, the food in your pouch. You *and* your pals inside the Ship."

"Shall we?" asked Greg. His voice was mildly incredulous. "Shall we?"

And all the time he was in a cold sweat of fear. He had realized, a second after his shouted orders to Ruth, what would happen if this uniformed braggart refused to play. He saw himself being hauled back to the city, the licking tongue of incandescence from the drive, the end of the Ship, the end of a world, the end of Man.

And the end of Jennifer.

"Take him away," ordered the officer.

"Wait!"

The policemen hesitated.

"You know what will happen if

you do, don't you? All of you can never hope to get those cans away to a safe distance inside of thirty minutes. And if I'm not back in the Ship—"

"What?"

"There's lithium hydride in those cans. Oh, yes, I might be bluffing. But you can't afford to call my bluff. You know what's going to happen if I'm right, don't you? It happened there!"

Greg pointed to the east. Earth, a lurid warning, was just rising.

"Take him away," said the officer.

There was a brief rattle of fire. The officer seemed to collapse in sections—knees, hips, shoulders, neck. He crumpled to the sand. And the man holding the smoking gun said: "I never did like him. And I've a wife and two kids in the city."

"He was killed in the fighting," said another. "Wasn't he, boys?"

And a third, to Greg: "Is it right what you're telling us?"

Before he could reply the first man broke in.

"But him and his mates murdered our pals!"

"There're your murderers!" shouted Greg, pointing. "There's Warren—and I shot him myself. Why do you think I was fighting them when you came up? Isn't it obvious that I was on your side?"

"Something in what he says—" grumbled somebody.

"You're boss," admitted the man who had shot the officer. "What do you want us to do?"

"Get these cans shifted. At least half a mile away. And every one of them. And when you're finished—one of you can wave to the Ship. If it's not light—wave a torch."

"And where will you be?"

"Inside the Ship."

"But—"

"We'll have to let him go," admitted the second man. "We've got to. Otherwise—"

"But I don't like it," grumbled the first man.

"Neither do I—but he's got us by the short hairs. All right, you, get up that ladder!"

And when Greg was hammering at the air lock door he heard somebody shouting.

"What are you doing with the Ship?" drifted up the voice. "Where are you going?"

"There!" bawled Greg. "There!"

He waved with his free hand towards Venus, climbing in the wake of ruddy Earth.

"There!"

"Can I come with you?"

"But you've a wife and two kids," shouted somebody. "*You* said it!"

"I know. And Mars is too small to get away from 'em." He called again to Greg. "Can I come?"

"Yes! Anybody else?"

But there was nobody.

And Ruth opened the door to Greg, and then the man who shot the officer, the man with the family, followed him up the ladder, and then the door was shut for the last time.

The remaining policemen worked

frantically in the cold dawn, lugging can after deadly can away from the field of the main drive.

"They're waving!" said Ruth.

"I see." Then, into the telephone, "Are you ready, Jenny?"

"Have been for hours!"

"Then— Stand by."

Greg depressed the firing key. A giant hit him, slapped him back and down into his chair. Dimly, through his mental blackout, he heard cries and screams from the body of the Ship. Slowly his sight cleared. He could see, mistily, his own hand before him, the bank of controls. Fighting hard for every fraction of an inch he moved the key up a notch, another notch, another.

The rate of acceleration dropped.

Greg snatched the telephone from its cradle, turned the handle furiously.

"Jenny, Jenny! Are you all right?"

Faint and tremulous came the answer: "Chief Engineer to captain. Badly shaken aft. No bones broken."

Ruth, climbing slowly to her feet from the quivering deck, screamed: "We've done it!" Then:

"But we shall find new wings, we know,
Climb to some world where rivers flow,
Where skies are gray, sea breezes blow—
Some day, some day, and far away—"

Greg winced.

But all that he said was: "No, not 'some day.' *Now.*"

And, into the telephone: 'Thank you for my new wings, darling."

And to himself: *"Now I've got to learn to use 'em!"*

THE END.

THE ANALYTICAL LABORATORY

The Analytical Laboratory this month constitutes rather a minority report; apparently the combination of holidays, most unusual weather, and probably in some cases mid-term examinations, reduced the number of readers' reports. Perhaps the fact that the extremely long fourth part of "Children of the Lens" and the long novelette "Now You See It" squeezed us down badly on number of stories contributed.

In any case, I have a most unusual Lab report to turn in, as follows:

January, 1948 Issue

Place	Story	Author	Points
1.	Now You See It	Isaac Asimov	1.33
2.	Children of the Lens (4)	E. E. Smith	2.26
3.	Tied between:		
	Advent	William Bade	3.05
	The Helping Hand	Burt MacFadyen	3.05

THE EDITOR.

MAN ON MIRA

BY R. S. RICHARDSON

***Our** cover this month illustrates a scene on a hypothetical planet of the binary star Mira—a system of a blue white star and a red super-giant. But this article discusses the behavior of this whole class of stars.*

About a century ago a unique scientific article appeared cleverly written in the guise of fiction entitled "The Thousand and Second Tale of Scheherazade."

The author, a man approaching middle age named Edgar A. Poe, related that in the course of some oriental investigations he had chanced upon a new account of the fate of the vizier's daughter, Scheherazade, in the Arabian Nights.

It will be recalled that in the usual version Scheherazade voluntarily marries a monarch who is in the habit of taking a new bride to bed each night and executing her the next morning. Scheherazade evades this fate by telling the king a story taking care always to reach the climax just before dawn. The king is so fascinated by her strange tales that he cannot resist hearing the finish, and so reluctantly postpones the execution until the following day. By keeping their relations on a night-to-night basis for a thousand and one nights, Scheherazade eventually breaks the king of a habit that was rapidly depleting the realm of the flower of its young womanhood.

In "The Thousand and Second Tale" Poe has Scheherazade tell the king of scientific discoveries that were the wonder of the world in 1840. But this time the king finds her tales so utterly preposterous that he becomes enraged at her lies, and has her executed without further delay.

Today the king's anger sounds unconvincing to us for the scientific wonders that Scheherazade described—the electrotype, Maelzel's automaton chess player, the man who made the sun paint his portrait,* et cetera—sound so prosaic as to be scarcely worthy of mention. Imagine the king's reaction to the tales a modern Scheherazade might relate—she has a Ph.D. in theoretical physics from the University of Calcutta—of a hole that behaves like positive electricity until the hole is filled;† of how the speed of an explosion was measured that occurred nearly a thousand years

* Louis Daguerre.

† Pair formation in nuclear physics.

ago;‡ and of an instrument so delicate that it can record the heat from a body four hundred million miles away that is 200° colder than ice.§

For the climax of his article Poe invents the tale of a nation whose inhabitants can easily see an object as it was ten years before. Here he refers to Bessel's announcement of the parallax of 61 Cygni in 1838, the first time that the distance to a star had ever been measured. "Although light travels 167,000 miles a second," according to a footnote, "the distance of 61 Cygni is so inconceivably great that its rays require more than ten years to reach the earth." * The best modern values for the parallax of 61 Cygni put it at a distance of 11.1 light-years in good agreement with Bessel's original measure.

Curiously enough, almost exactly a century after Poe wrote "The Thousand and Second Tale," 61 Cygni again attracted attention when the first interstellar planet was discovered in the system. Astronomers had long known that 61 Cygni consisted of two stars, A and B, revolving around their common center of gravity, so close together that to the unaided eye they appear as one. The motion of B accurately determined from a long series of photographic observations showed small but definite deviations from a smooth curve, due to the disturbing attraction of an invisible companion. Calculations revealed that 61 Cygni C was only about sixteen times as massive as Jupiter, making it either a giant size planet or a pint size star, depending upon your point of view.

It is useless to try to discover interstellar planets by straining your eyes looking for them through a telescope. If forced to rely solely upon direct observations, we might never have known whether planets exist outside the solar system or not. But knowledge of even a single planetlike body attending another star, gives us confidence that there may be many more in the galaxy, with possibly a few that are suitable for the development of higher forms of life. What form life might take upon the surface of another planet is wholly a matter of speculation. This much we do know—life upon a planet in a double star system would certainly differ widely from life upon the earth. Here we are upon fairly solid ground, for an astonishing amount of information has been gathered about the size, mass, temperature, and physical constitution of the stars in dozens of binary systems.

Mira the Wonderful

The constellation of Cetus is one of those numerous asterisms that seems to have been created mainly for the purpose of filling a large blank space upon the celestial

‡ Rate of expansion of the Crab Nebula in Taurus measured by the Doppler shift of its spectrum lines. It has been identified with the supernova of 1054 A.D.

§ Temperature of Jupiter determined by the vacuum thermocouple.

* A century ago the only method of determining the velocity of light was from the eclipses of Jupiter's satellites. The velocity of light measured by Anderson using the Kerr cell is 186,275 miles per second.

sphere. It is doubtful if the heart of the most enthusiastic astronomer ever leaped up upon first beholding the constellation of Cetus the Whale.

Yet if an astronomer worked long enough in this region—say about six months—he would certainly notice that something was happening in Cetus. One of its stars was unquestionably changing in brightness. At first he would think his memory was at fault or that he had mistaken one star for another. But a careful check would show that no mistake was possible. A star that was barely visible a month ago had grown until it outshone all others in that vicinity. The star might continue to grow until it rivaled such sparkling giants as Betelgeuse and Antares. Then it would begin to fade and within a few months would have vanished as mysteriously as it had come.

Credit for discovery of the first variable star is generally accorded to a Dutchman named Holwarda, who made several observations of the star in Cetus.* While watching an eclipse of the moon in 1638 he noticed a bright star where he was unable to recall having seen one before. At first he thought it was a meteor but upon investigating found that the light came from a star apparently no different from hundreds of others in the sky. When he looked the second time, however, the star had disappeared or at least he was unable to find any trace of it. But while examining the same region a year later he was amazed to find the star shining as brightly as when he first saw it during the eclipse.

Observers after Holwarda were so fascinated by the changing brightness of the star in Cetus that one of them called it *Mira*, the Latin word for wonderful. Although its official scientific designation is *omicron Ceti*, astronomers still prefer the more poetic name of Mira Ceti, or simply Mira. And despite the fact that the fluctuations in the light of Mira have been studied now for three hundred years practically without a break, today it seems just as wonderful and mysterious as when astronomers peered at it through their first crude telescopes.

About 1660 several astronomers began to make a serious business of keeping track of Mira, with the result that its luminosity or magnitude was found to vary in a period of eleven months. The accumulated observations of three centuries have fixed the period as 330 days. This does not mean that if Mira is at maximum brightness today it will be at maximum again in, say, 10 x 330 or 3300 days. We would be fairly safe in assuming that Mira would be bright again after another 330 days or even 660 days, but our predictions would certainly fail if carried far into the future. For the light cycle of Mira is only roughly periodic like the changing frequency of spots upon the sun. Thus we speak of the eleven-year sunspot cycle but no one would think of

* Fabricius noted the remarkable variations in the light of Mira forty-two years before Holwarda, but for some reason failed to follow up his discovery.

using this periodicity alone if attempting to make long-range predictions. For it is eleven years *on the average*. It has been known to be as short as 9.0 years and as long as 13.6 years. Similarly, the period of Mira has ranged all the way from three hundred days up to three hundred seventy days. Stars that undergo changes in brightness of about this length belong to a class known as long-period variables.

In contrast to the long period or Mira variables with periods up to 1380 days, other types are known with periods of from six days down to 0.061038639 days or ninety minutes in the case of CY Aquarii. The short-period variables run through identically the same changes in brightness over and over again as if operated by clockwork. We can think of the speedy little short-period variables as tiny motor boats flitting back and forth across a lake always right on schedule, while the ponderous long-period variables are great ocean liners whose return to port is uncertain by many days.

The long-period variables are all red and orange in color, Betelgeuse probably being the best known example. They are the coolest stars that we can observe directly. At minimum the surface temperature of Mira falls to 1800°K, which is less than the temperature of an electric light filament. At maximum it does not exceed 2300°K. These temperatures may seem fairly high compared to those familiar to us from daily experience, but as a star Mira is like a snowball among glowing coals. The surface temperature of the sun is 6000°K. The white stars in Orion are at about 20,000°K. And the star at the center of the Crab Nebula is believed to have a surface temperature of 500,000°K!

Since the long-period variables are so cool we might expect them to be extremely faint, but on the contrary they are among the brightest stars in the heavens. Now one star may appear brighter than another merely because it happens to be closer, but if the stars were all at the same distance from the earth the high luminosity of the long-period variables would be evident at a glance. When at maximum most of them are a hundred times brighter than the sun. Although certain stars are a thousand times brighter than the sun such high candlepower objects are extremely rare. If we had eyes like a thermocouple that were sensitive to infrared as well as visible light, Mira would rank as the ninth apparent brightest star instead of about No. 900.

The reason these cool stars are so bright is because they are so big. They are classified as *red giants*, a name that originated before their nature was well understood, but which has turned out to be a remarkably good choice. When the diameters of some red giants were announced in 1920 from interferometer measures the news created a sensation. Arthur Brisbane used it for the subject of his Sunday editorial to let us know how small we are compared with Betelgeuse.

Even astronomers, hardened as they are to big numbers, could scarcely believe that Betelgeuse or Antares would fill the solar system out to the orbit of Mars. Five years later Mira was found to be about the same size as Betelgeuse. The diameter of Mira is rather uncertain owing to the uncertainty in its distance. The interferometer does not give us directly the diameter of a star in miles but its angular diameter in seconds of arc. To change the angular diameter to miles the star's distance must first be known and unfortunately a reliable value is not always available. The best determination of the distance of Mira—which is not too good—places it at 192 light-years, making its diameter roughly 300 million miles or 346 times the diameter of the sun.

If the mass of Mira were proportional to its volume, the star would weigh twenty-five million times as much as the sun and according to relativity the force of gravity at its surface would be so great that light could not escape into space. Since light seems to experience no trouble in this respect we infer that the mass of Mira falls far below this figure. Probably ten times the mass of the sun would be a liberal estimate. When this mass is combined with the diameter determined by the interferometer the average density comes out less than one ten-thousandth that of air at sea level.

Admitting that this is nothing but a rough approximation, there seems no escape from the conclusion that Mira consists mostly of vacuum. The outer portion must be so highly rarified that at close quarters we would be unable to draw a line where space leaves off and star begins. Travelers in an insulated spaceship might cruise around in Mira for days without ever being aware they were inside a star, thinking they were trapped in some strange hyperspace enclosing them on every side with shining red walls. Lacking delicate sounding instruments they might never be able to escape from the impenetrable sea of red vapor, for the temperature and pressure of the gas increase so gradually toward the center that they would be unable to tell which way was out. Instead of pointing the ship for the surface they might send it plunging full speed ahead toward the central nucleus!

There are both observational and theoretical reasons for thinking that long-period variables pulsate, expanding and contracting convulsively like the respiration of some living creature. The interferometer showed that Betelgeuse apparently decreased from a diameter of 300 million miles in November, 1921, to 180 million miles in November, 1922, shrinking at an average rate of 164,000 miles a day. If these are extreme values they indicate that Betelgeuse can swell or contract by about thirty per cent on either side of its mean diameter. In Mira the pulsations are only about half as great or from 350 million miles to 260 million miles, but still 90 million miles!

Although a red giant like Mira

is millions of times more massive than the earth, a spring balance would show that a man on the surface of one would weigh less than an ounce. (Of course, it is only by courtesy that a red giant can be said to have a "surface." We have to imagine an artificial boundary drawn in the outer atmosphere of the star.) A man on Mira could toss a steam shovel about with ease, establish a record of a mile in the high jump, and fall thousands of feet without injury. It is interesting to note that gravity on the surface of an asteroid—one of the smallest bodies in the universe—and gravity at the surface of a red giant —one of the largest bodies—would be just about the same.

A space traveler would experience one sensation on a star like Mira that is wholly unknown to planetary dwellers. Gravity at the surface of a sphere depends both upon its mass and its diameter. Since during a pulsation the mass remains fixed but the diameter changes, then gravity at the surface must also change. This force would be least when the star is most distended and greatest when contracted to its smallest diameter. Thus between November, 1921, and November, 1922, gravity at the surface of Betelgeuse increased by nearly four hundred per cent. During this time the traveler would seem to be losing strength as gravitation increased and everything seemed to be growing heavier. In the solar system, his sensations would correspond to those of a man going from the Earth to Jupiter.

The Cause of the Light Changes

Why does the light of Mira change in brightness?

Many ingenious theories have been devised to answer this question, some of which may contain an element of truth. Usually we cannot tell whether a theory is right or wrong because we are too ignorant to make a critical test. We do not know why a red giant shines at all let alone why it shines at a different rate at different times.

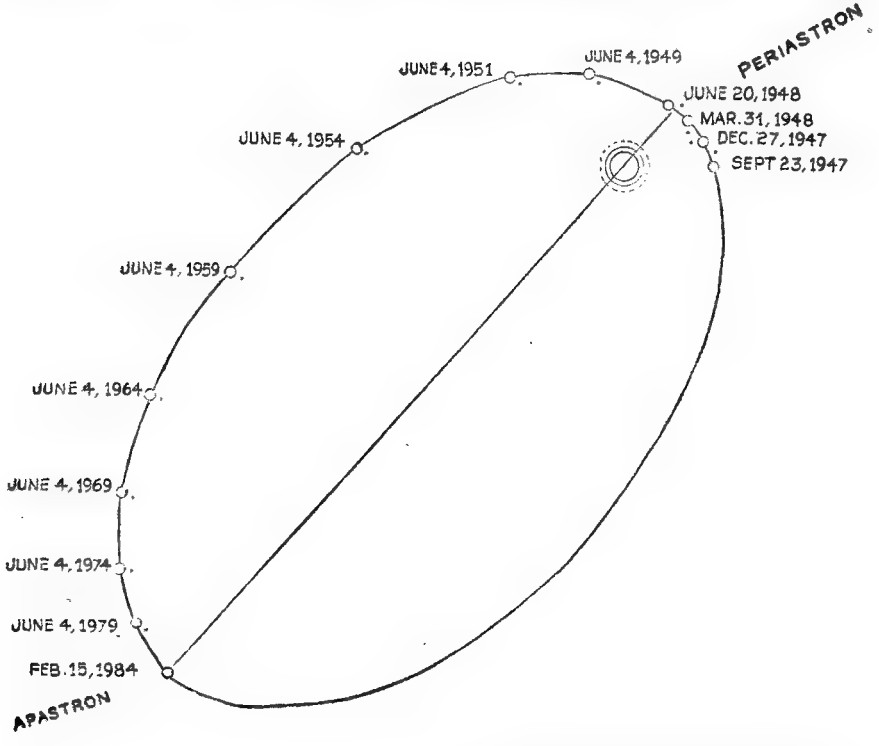
Right now astronomers feel pretty confident that they know the source of energy that keeps the sun shining steadily century after century. In stars similar to the sun—the dwarfs—with a central temperature of 25,000,000°K, a series of nuclear reactions can occur in which carbon and nitrogen transform hydrogen into helium with the liberation of energy. The helium formed at the end of the series does not quite equal in weight the hydrogen fed in at the beginning, the mass lost in the process being converted into radiation according to Einstein's famous little equation $E = mc^2$. Moreover, calculations show that this carbon-nitrogen cycle is the *only* nuclear process able to liberate energy at the rate the sun is actually observed to radiate it off into space.

In a star like Mira, however, with a central temperature probably as low as 5,000,000°K, the carbon-nitrogen cycle is much too sluggish. Trying to keep Mira glowing on the carbon-nitrogen cycle would be like trying to heat an apartment house with an electric toaster. It is true

that other nuclear reactions are known that will release energy rapidly at 5,000,000°K, but invoking their aid is of little help because they immediately involve us in other difficulties. For example, if the source of energy in red giants consists of reactions between hydrogen and other light elements, we would expect them to evolve along certain lines not confirmed by observation. At present astronomers know so little about stellar evolution that they cannot say whether Mira is young or old; whether she is in her lusty youth or senile old age. In fact, we might as well be honest and say that astronomers do not really *know* one single thing about stellar evolution.

One of the earliest theories to explain the changing brightness of Mira was that of an eclipse by a dark companion. There are many close doubles of unequal luminosity which regularly change brightness as one star passes in front of the other. These eclipsing binaries are, of course, not true variables although superficially they behave like

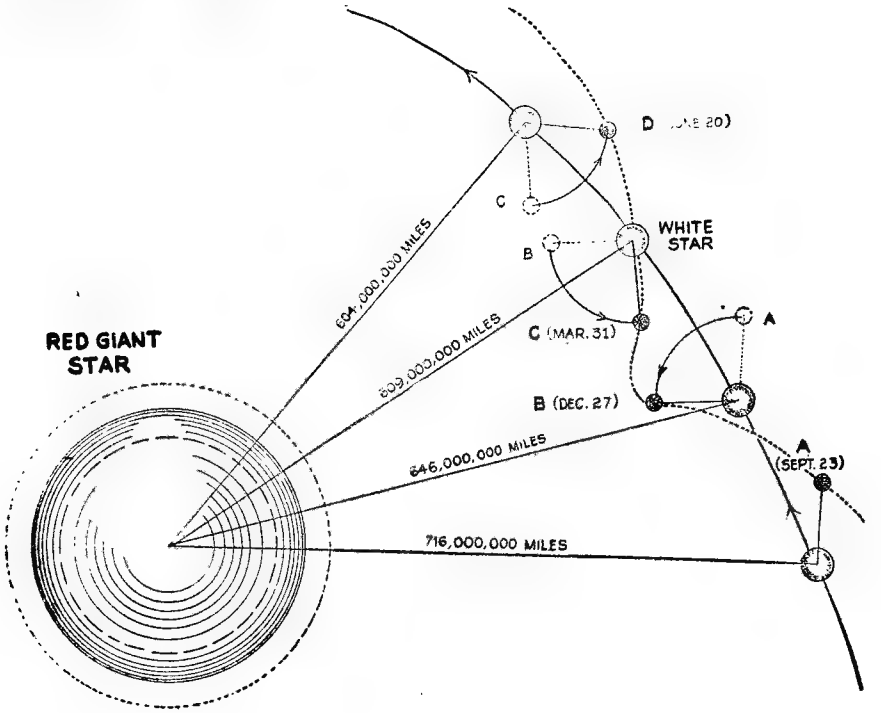
Fig. 1. Hypothetical binary system consisting of a solar-type sun revolving about a red giant sun. This represents a typical binary system involving a red giant rather than any specific binary.



them. The variations of Mira can be reproduced fairly well by assuming a dark companion of suitable size revolving in an orbit of the right dimensions. (In one theory a swarm of meteorites was substituted for the dark star.) Minimum occurred as the dark body passed between Mira and the earth cutting off more and more of its light. The eclipse theory died a sudden death when the diameter of Mira became known, for under the most favorable assumptions possible to the theory the dark companion would have to revolve in an orbit *deep within the interior of Mira herself.* The idea of one star burrowing along inside another was a bit too far-fetched even for astrophysicists to consider seriously.

In 1913 the late W. W. Campbell, formerly Director of the Lick Observatory, proposed a mechanism of light variation for Mira to which he gave the intriguing name of the "crust struggle" theory. Back in those ancient times, astronomers did not refer to the red giants in such slighting terms as "red hot vacuums" or "vast aggregations of nothingness." Rather they supposed them

Fig. 2. Section of orbit of Fig. 1, showing added hypothetical Earth-like planet, revolving about the smaller star in 1.0 year at 93,000,000 miles distance.



to be fairly substantial bodies having a definite surface boundary. Campbell assumed that cooling on Mira had progressed to such an extent that a perpetual struggle went on between opposing forces to form a solid crust over the surface. As the crust spread, obscuring more and more of the fiery vapors below, the star's light gradually diminished. But at the same time the temperature of the imprisoned gases began to rise exerting a steadily increasing pressure against the surface, until eventually a break-through occurred at some weak point, the crust was destroyed, and the brightness rose rapidly to maximum. After the outburst had subsided the crust began to form anew and the struggle began all over again.

Our conception of stars has undergone such a revolution in the last thirty years that the idea of Mira incased in a solid crust seems incredibly naïve. The crust struggle theory has proven remarkably durable, however, for recently it was revived in a drastically modified form. The principal alteration consisted in scrapping the old crust for a thin veil of liquid particles formed by condensation in the star's upper atmosphere. Fine particles can be practically as effective in stopping light as a solid wall, the smoke produced from a few tons of coal being a familiar example. By making the particles of just the right size—about forty millionths of an inch in diameter—they would cut out blue and red light by equal amounts. This would bring the theory into good agreement with the results of many observers, that although a long-period variable may show a big drop in total brightness its color remains virtually the same.

We have previously noted that Mira and Betelgeuse probably pulsate, signifying that they are unstable bodies in which internal forces fail to balance. There are many people who become emotionally upset for days over some trifling incident, and similarly there seem to be many stars in such a delicate state of equilibrium that the least disturbance will immediately start them pulsating. The gases begin to expand, rushing outward until the star is swollen far beyond its average size. Eventually the outward force is spent and the expansion stops, leaving the star in a strained and bloated condition. Now the force of gravity begins to predominate causing contraction, slowly at first and then more rapidly. The star shrinks until increasing gas pressure finally brings contraction to a halt. Then, like the vibrations of a great pendulum, the swing reverses direction and the star begins to expand.

I remember distinctly a pulsating star that two astronomers built for a popular scientific exhibit in Washington, D.C., some years ago. The star was represented by a balloon that expanded and contracted by means of compressed air automatically controlled. Red and yellow lights within the balloon lit up at appropiate intervals to show how the color—or temperature—of the star changed with size. The com-

pressed air machine didn't work very well so that the star huffed and puffed like an ancient locomotive on a steep grade. But it proved to be a highly successful exhibit, people watching it silently with fascinated attention, expecting the star to blow up every time it started to expand.

Eddington developed the mathematical theory of pulsation for a special class of short-period variables called Cepheids with considerable success. He attempted to apply the same theory to the long-period variables but the results were not so convincing. The two groups of stars differ so widely in their characteristics that is it doubtful if the same assumptions can be applied to both.

At present astronomers incline to the view that the light variations of the Mira variables arise from a combination of several effects, among the most important being changes in surface temperature, veiling, pulsation, and absorption of light by chemical compounds such as titanium oxide (TiO). But the underlying cause behind these purely surface features is still wholly unknown.

The Companion of Mira

In 1916, A. H. Joy of the Mount Wilson Observatory began an investigation of Mira Ceti which was destined to extend over nearly nine years. One of his main objectives was to secure photographs of the spectrum of the star during its entire light cycle. The spectrum of a star constitutes practically our sole source of information regarding its constitution. The light collected by the telescope in the form of a concentrated beam is sent through an arrangement of prisms and lenses which spreads it out into a narrow rainbow colored strip or spectrum. The spectrum of a cool star like Mira will be crossed by many dark lines and bands due to absorption of its light by elements and compounds in its atmosphere. An astrophysicist can learn as much about a star from the detailed study of the lines in its spectrum as a fingerprint expert can learn about a man from the whorls and loops on his thumb.

Previous to 1916 no telescope was sufficiently powerful to secure properly exposed photographs of the spectrum of Mira when at minimum light. With the completion of the 100-inch in 1919, however, this obstacle was at last overcome. Only a year later at the minimum of January, 1920, evidence was obtained for an effect that before had only been suspected. Mira definitely had some sort of an attachment on one side nobody knew exactly what, that was either "a tail or shell . . . or a companion star."

The most likely assumption was, of course, a faint companion that emerged into view when the light of Mira was weakest. Although the double-star men had never reported a companion it was possible that they had overlooked it or looked at the wrong time. In 1922 the famous astronomer Barnard, discoverer of the fifth satellite of

Jupiter and renowned for his keen vision, failed to resolve Mira. Nevertheless, the feeling grew that a companion existed. On October 6, 1923, Joy wrote to Robert G. Aitken, one of the most experienced double-star observers of his time, asking if he would care to undertake a search for a companion of Mira with the 36-inch refractor of the Lick Observatory.

Aitken naturally realized that his only hope of success lay in waiting for a night when the atmosphere was exceptionally steady and the star images reduced to hard pinpoints of light, instead of resembling fuzzy balls of yarn dancing about as they do under poor seeing conditions. Not until the night of October 19th did he feel that conditions justified turning the lens of the great telescope on Mira. Doubtless without much enthusiasm he made the setting, clamped the instrument in declination and hour angle, and adjusted the focus of the eyepiece.

To his astonishment the companion was visible at the first glance not much fainter than Mira herself! It lay in the same direction that Joy had predicted but at a considerably greater distance.

Why the companion of Mira so long escaped detection remains a mystery to this day. Barnard probably failed because of poor seeing conditions. At first astronomers supposed that the companion was in rapid motion around Mira so that on former occasions its feeble light was drowned in the glare of the red giant. But after a quarter of a century the position of the companion is essentially the same as when Aitken first observed it. Most reasonable explanation is that the companion of Mira is some kind of a peculiar variable itself. Apparently it was near maximum in 1922 or 1923, for in 1925 it was much fainter and has been slowly declining ever since.

I happened to be on Mount Wilson in August of 1947 while Dr. Joy was working at the 100-inch. When I inquired if Mira was near minimum he told me to ask him again the next morning. "I'm going to look for the companion tonight. If it's visible, then Mira's exactly at minimum. You've got to hit minimum smack on the nose if you want to see the companion."

I had half a notion to stroll over to the 100-inch that night and help him look. But since I had to be up observing the sun before six o'clock, and since Mira did not rise until after two, I finally decided to take a chance and let the opportunity go. "Besides," I told myself, "if Mira isn't at minimum the companion won't be visible anyhow."

For once I gambled and won. Next day at lunch Joy reported Mira was eighth magnitude, so bright that the companion was completely blotted out.

In every respect the companion of Mira is the opposite of its giant primary. Instead of being of enormous proportions it may not be as large as the sun. Its surface is white-hot instead of red-hot. Instead of being highly luminous it is

abnormally faint for a white star. And yet it is not faint enough to qualify as a white dwarf, tiny white-hot stars thousands of times as heavy as lead or gold. In fact, omicron Ceti B refuses to fit into any recognized scheme of stellar classification but constitutes a special class all of its own.

What a strange sight the heavens would present to an observer on a planet revolving in the system of Mira! In the illustration, Chesley Bonestell has shown how Mira and its companion might look from a planet similar to the earth. The painting expresses realistically the ideas that astronomers have stated in abstract terms in their technical papers. The planetary landscape is necessarily imaginative but details in the representation of the two stars are based upon expert opinion.* You are supposed to be viewing Mira from a distance of six hundred million miles or roughly six times the distance of the sun from the earth. The red giant would occupy a space in the sky equal to fifty-six times the diameter of the full moon. The phase is intended to correspond to minimum light so that the surface is heavily obscured by veiling. At this close range the tenuous character of Mira's extensive atmosphere is easily visible.

The companion at a distance of fifty million miles is seen in transit across the disk of Mira. It is a dazzling white diamond on a dull crimson background.

(Readers may be interested to know that Mira and its companion presented Mr. Bonestell with a difficult technical problem—that of painting red and white with equal intensity. White reflects all colors of the visible spectrum. Red reflects only the red portion—about twenty per cent of the visible spectrum—the other eighty per cent being absorbed. Obviously it is impossible to make the red and white of equal value. The intensity of the red light was heightened somewhat by adding white and yellow but stopping short of pink or orange.)

Life Without Rhythm

People often complain that the winters are getting colder and the summers getting hotter, and that the climate certainly isn't what it used to be. The trouble is that we are badly spoiled by life upon a planet where conditions change so regularly that the slightest fluctuations from the mean annoy us tremendously. We are creatures of rhythm, conditioned to the fast 2/4 tempo of day and night superimposed upon the slower 4/4 beat of the seasons. Man might develop dangerous neurotic symptoms if forced to live in certain binary systems where there is neither night nor day but only a confused mixture of the two.

Figure 1 illustrates the state of affairs that would be encountered in a binary system composed of a red giant and a solar type star revolving around it in an elongated

* Several changes were made in the original sketch at Dr. Joy's suggestion.

orbit. The system does not represent any particular double star but is typical of several whose elements are well known. Since this system is ours to do with as we please, let us endow the solar star with a planet like the earth which goes around it once a year at the same distance that the earth revolves from the sun.

Star and planet revolve around the red giant in a period of sixty-nine years. The two barely creep when farthest away at apastron, but move at top speed when nearest the red giant at periastron, as shown in Figure 2. We have purposely made the conditions to which the planet is exposed identical with those upon the earth except for the presence of the red giant. How will the red giant alter the situation?

We will start by supposing the star and planet to be near periastron at A which corresponds to the orientation of the earth with respect to the sun on September 23rd. In the northern hemisphere the day would be growing shorter and the weather becoming increasingly colder.

The two move on to B where the orientation of the planet corresponds to winter in the northern hemisphere with its short days and long cold nights. But since the planet is now between the solar star and the red giant daylight would prevail for twenty-four hours over its surface. The red giant would be coming up like thunder out of the east when the solar star was going down in the west, and vice versa. The temperature instead of falling would be rising since light from both stars is beating down continuously upon the surface.

Star and planet swing on to C which corresponds to the position of the earth with respect to the sun on March 31st. Here there would be a respite of three or four hours when neither star would be above the horizon allowing the inhabitants a little relief from their burning rays. The region of night would spread until at D both stars are on the same side of the planet so that day and night prevail about equally over the surface. Here the date corresponds to June 20th on the earth which means that both stars would be shining over the north pole. This might cause a quick rise in temperature but before it had begun to take effect conditions would change again as the star moves on in the direction of the arrow.

We would probably have little trouble adapting ourselves to rapidly changing conditions provided they occurred over and over again in the same succession. But in this particular binary system we would seldom experience the same conditions a second time for they do not repeat until after sixty-nine years. Thus a man might remember how as a little child he sought refuge from the burning heat of the red giant at the last periastron passage. Now in his old age he watches the red giant loom larger and larger in the sky and wonders with vague apprehension if he can survive a second ordeal.

THE END.

BRASS TACKS

"The Non-Sanity of Non-Aristotelian Systems"

Dear Mr. Campbell:

The last time I wrote you, some two years ago, A. E. van Vogt's great serial, "World of Ā," had just been printed. But to the best of my knowledge, a definite explication or analysis of that novel has yet to be written, even though semantics has become standard fodder for your writers—almost as standard as the space warp, or telepathy.

How many of those writers, however, and I specifically except van Vogt, have read Korzybski's "Science and Sanity" or even Hayakawa's "Language in Action"?

But that isn't the point of this letter. If this letter had a title, I'd like to call it "The Non-Sanity of Non-Aristotelian Systems". What I'd like to do is to stir up some foment among the semanticists and question the basic premises of null-A.

There can be little argument today about the fact that our contemporary math and physics is non-Euclician and non-Newtonian. Einstein, Reimann, and others too numerous to mention have proved that beyond question. Not to mention Hiroshima.

But—and here is where Korzybski makes what he might term a "non-logical" step—merely because those two things are true, can we then assume that contemporary thinking or thought processes should necessarily be non-Aristotelian? Mind you, I'm not disputing the logic or even the efficacy of the system after we have accepted the premises, but I'm taking the liberty of disagreeing with the premises of the system itself.

"Infantile" this may be, but basic, and I have yet to discover a semanticist who can justify that step. Almost any good Aristotelian or Thomistic logician can make a semanticist look silly by "distinguishing" him to death.

What think you? An analogy might be drawn with science fiction

itself. Most stories depend for their action upon inventions that are assumed into existence, as atomic energy was in the late thirties and early forties. Today we assume contraterrene matter, shall we say, and write a story with that as our premise. But when we question the probability of the existence, or the logic of the existence of contraterrene matter, the story has no point *except* as entertainment.

Enough of that. I think the most significant thing about the Smyth report isn't even found in the body of the book. It's found on the reverse of the title page where Smyth says "Reproduction in whole or in part authorized and permitted." That seems to sum up the entire feelings of scientists and others who know that our present policy of preserving atomic secrets (sic) will only lead to disaster on a world wide scale.

Perhaps we should blame the Boskonians or the unspeakable inhabitants of Ploor for all of this. And it seems that "Children of the Lens" is shaping up nicely into another titanic intergalactic epic. It might be heresy to say that I think that as yet the novel is a trifle disjointed, but the two remaining parts will undoubtedly smooth off the rough edges. Guess the main trouble is that we don't have third-stage minds.

The much heralded renaissance of ASF, often called the new golden age, or something, will never come as long as stories like "The End Is Not Yet" are published under your aegis. That was unquestionably one of the most poorly constructed novels, from a purely literary standpoint, that I've ever had the misfortune to read.

For the Lab in December I would rate "Children of the Lens" first, "Aesop" second, and then "The Barbarian", "The Dreamers," and "Age of Unreason" in that order.

Another point that I'd like to mention, even though I'm afraid that this letter has become inordinately long, is the vast number of series stories that appear off and on in ASF. In the December number we had two, "Aesop" in the Cities group, and van Vogt's latest episode in the "Child of the Gods" saga. Offhand, without consulting past numbers, I can remember the Baldy group, the Foundation stories, the Venus Equilateral cycle, the Plutonian Lens group, the Artur Blord melodramas, and the Robot group. I wonder about this tendency, although I must admit that some of them have apparently been dropped. Admittedly you don't need to know the past history of the story in question to appreciate it, but how many of your readers are like myself, who didn't like Simak's stories at all until I had read two or three?

About the art work. Frankly I don't care much one way or the other. Leave it out completely and I'd be just as happy—it takes up space that could much better be utilized with more stories. Best of the recent covers, though, was the October one of the Sun with Mercury in transit. It was far beyond anything that might even be expected from the magazine.

It might also be of passing interest to note that some literary leaders are coming to recognize the value of science fiction. My advisers at school might let me write my Doctoral Dissertation in English on "Trends in Scientific Fiction, 1935-1947". I'll let you know if it is finally approved, because if it is, I'll most certainly call on you for information and advice.

Incidentally, what was wrong with my idea of two years ago, written during the "hard vacuum" era, of a vacuum atomizer. I still think its a good one. You can never tell when you're going to need a vacuum atomizer.—Willis E. McNelly, 7225 S. Perry Street, Chicago, 21, Illinois.

The ruling animal fights its way to the top—and tends to go on fighting on momentum, I guess.

Dear Mr. Campbell:

After reading ASF for fifteen years I am making my first try for Brass Tacks. I started out by reading a raft of publications, but came to the conclusion that the kind of stories I like appears with sufficient frequency only in Astounding.

I find it hard to explain just what I prefer in the science-fiction field. I like stories that are believable—the kind that make me think, "This could happen—and maybe will some day." Most of Astounding's better writers do this, and the science is as carefully worked out as in the novels of the late, great H.G. Wells. But some of my favorites belong to another class, the frank fairy story, which used to appear in *Unknown*.

I think it is just that I like the stories better. They are better told, and include some first-rate artistic fiction, such as "The Gnarly Man", and "None But Lucifer". In contrast, the offerings of your competitors remind me of a western dime novel with Mars substituted for Arizona and a rocket ship for Silver.

I hope that Abrams will go further into the subject of White Dwarfs in another article. He mentions Roche's limit, which is a subject I should like to see explained. It seems to me that disruptive tidal forces on a satellite would be a function of the mass of the primary rather than of its diameter. Suppose the sun, without increasing in mass, were to expand until its diameter was two-thirds that of the orbit of Mercury. Would Mercury then fly apart from tidal forces?

Incidentally, I'd like to see civilians and the armed forces get together for a change and try to understand each other. There was one of L. Ron Hubbard's stories in 1940 (?) called "Final Blackout" in which all the civilian characters were either stupid clods, despoilers of women, or bumbling American politicians; and now in "The Dreamers" the military are all conscienceless power-grabbers. We might have to work together again some day, you know!

"The Dreamers" also illustrates the disgusted point of view: man

as a species is a failure and not worthy to be the inheritor of the stars. Well, that may be—but it would be a lot bigger job to make an angel out of any other likely species than to make one out of man. Many of the traits that make Homo sapiens so unsatisfactory stem from his intelligence and adaptability rather than from any fundamental and peculiar emotional bias. Men like to tease, torture, and kill—but so does just about every other animal that has teeth or claws or a sting, even such unpromising subjects as mice and rabbits, if their instincts are thwarted by something weaker. It is a safe bet that if the higher primates were exterminated, the next animal to win to a big brain and dominance over the planet by the hard road of natural selection, would be just as cruel and rapacious as the present title-holder. All one could hope for is that it be more aware of its best interests than man is.—Alfred B. Mason, 32 W. Washington Street, Kensington, Maryland.

The paper situation has improved We can at least think about Unknown *now.*

Dear Sir:

Just three weeks ago I was in the United States awaiting air transportation to Manila and got the long longed-for November issue of ASF. I finished part one of the latest Smith opus, "Children of the Lens", at eight thousand feet over the Pacific in an ATC C-54 enroute to Honolulu. The end of Part One left me, literally, up in the air. I usually wait till I have all parts of a serial before I start it but I couldn't wait this time. I dove right into the further adventures of Ole Indestructable, Our Hero, K-Kinnison. My liking for Smith has grown a little. If this "hitherto unrevealed conflict" ties the whole series of Lensmen novels together with a long-run purposive thread, it will make them something more than the interesting, supergalactic Western epic they have so far been. I hope so, anyway. To me one of the main weak points in Smith's Lensmen series has always been the Arisian's altruistic help in the providing of the infant Patrol a positive means of identification, apparently just to help right vs. wrong, in the Lens. That has begun to straighten out, now, with Kinnison's realization that the Lens is a little more than what it seems, and now it is starting to be clear that the Arisians had a more firm, deeper, ulterior purpose of their own in providing help and the Lens. Kinnison, the Patrol, and perhaps Civilization itself have been developed for, and used as, tools . . . for what? Who are the Eddorians, hm-m-m?

I will confess, though, that I was fooled for quite a while after the finish of "Second-Stage Lensmen" —I really thought Ole Mass of Muscle had finished off Boskone. Kinnison's smoothly plausible explanation of Mentor's statement that his marriage was "necessary", fooled me completely. Though I did detect that Mentor's explanation of

Fossten was incredibly vague for that cold mentality, lacking Mentor's usual cold, flat, accurate statements, given with his take-it-or-leave-it attitude of unconcern, I put this down to a slip in Smith's characterization. Now that it is becoming clear that there was no slip, I am rather red-facedly realizing that Smith is much better than I had previously thought at construction. His writing is improving, noticeably, with each novel. His alien characterization ranks with the best I've ever come across; however, his humans are unreal, wooden; to my mind, Kinnison does not speak nor act much as a man of his supposed IQ would think, speak and act. Exactly how such a man would react, (he said anticipating the inevitable question,) I don't know; but Kinnison does not convey that illusion of high intelligence. In fact when the human-interest scenes in the Lensman saga are compared with those in, say, Heinlein, Hubbard, Moore, O'Donnell,—in Sturgeon's excellent, moving short, "Thunder and Roses"—Kinnison and the Red Lensman look just a little silly.

But give the boy his right credit —when he gets his adjectives, primaries, secondaries, negative-matter bombs, Grand Fleets, and gadgets moving and in action, nobody can match him. A Smith novel is worth waiting for, in anybody's language.

Which is why this letter. For some inconceivable reason, not a store, not a stand, not even the PXs here, seem to stock my favorite S-F magazine! I do not propose to wait until 1949—the probable date of my return to the States—to find out what happened to Kimball Kinnison. Nerves can stand just so much and mine won't stand two years of waiting, as well as missing all of the best S-F generally published in that time. Ergo, inclosed is the sum of three dollars and twenty-five cents for a year's subscription to Astounding.

"Fury" was swell, nice writing, nice characterization, good action. I could have stood more of Mrs. Kuttner's famous descriptions and delicate beauty of writing, especially in a more thorough background of the decadent, pleasure-seeking, static world of the Keeps. One of your best serials, all in all, with a magnificent Rogers cover. Glad to see him and Schneeman back. Use more of Schneeman, please, especially on the inside.

Alejandro's new-type cover was breath-takingly beautiful. It utterly eclipses his first cover, which was poor, to say the least. Let's have more of this type, the new style, symbolic cover. I'm eagerly awaiting the Alejandro cover on the December issue.

Williamson's two novelettes, "The Equalizer", and "With Folded Hands" were great. I really enjoyed them. In your article in Eshbach's "OF WORLDS BEYOND", you imply a sequel to "With Folded Hands." Bring it on. The difference in Williamson's work and the trend from the sensational, adventure style throughout the past few years, is interesting to

observe—ten years ago, "With Folded Hands" would have been told from the viewpoint of the man who came to kill Sledge, and would have ended in their destroying, jointly, the great machine, after a tremendous struggle with the guarding robots—a la part two of "The Legion of Time". This development would cause the story to lose much of its power and final sense of futility and helpless anger. Williamson has improved.

So has your art work, after a considerable struggle with Swenson's blotches.

"The End is Not Yet" is, as you said, a sort of revised "Final Blackout." While it has its moments of power and compassion, it is not as memorable as its famous forerunner; Martel does not come to life quite as vividly as the Lieutenant. The final scene of Martel's death is not as powerful as the final one in "Blackout". But that is not to say that "The End Is Not Yet" is not good. Far from it. I liked it very much, almost as much as "Fury", which was the best serial published in Astounding since "World of Ā".

I particularly liked Rogers' depiction of Banks and Martel. I like the wash drawings, too, but I think they should wait til you get a slightly better grade of paper more suited to reproduction of them.

One more thing and I'll stop all this chit-chat. GIVE US BACK *UNKNOWN* AS SOON AS POSSIBLE. PLEASE.—Frank D. McSherry, Jr., APO 707, c/o P.M., San Francisco, California.

That Smith is George O.

Dear Mr. Campbell:

Astounding Science-Fiction, October 1947, p. 53: "Yes," said Woodart, "though the power is more on the order of a hundred thousand kilowatts."

Ibid., p. 54; "Woodart continued — '. . . which accounts for seventy thousand kilowatts of *energy*.'"

Let us face it, Mr. Smith. That's supposed to be a scientist talking. Seems as though that "per-second" keeps popping up to heckle you. First light-seconds in the numerator, now Joules.

Kilowatts are cheap, but just spend any time using them and watch that little wheel in the basement go 'round.

Had enough?—Rodger R. Lowe, Schlieter & Lowe, Electronic Technicians Field Office, Saipan, Marianas I.

Remember all of his list of Old-Timers?

Dear Mr. Campbell:

At first I thought I'd wait for the December issue before sending this in but there's enough material here for a reasonably long letter and I might have something else to send in with ratings next time.

I've been going through my stack of old Astoundings and noting down a few things. Firstly, I'm surprised at the number of stories that I've discovered I want to read over. Rereading has caused me to lower slightly some of my ratings, but many others have continued to have their old appeal.

Ever think about the number of stories which you have run which are units of a series? And those series have developed some of the higher ranking stories. Let's list a few:

Weapon Shop Series	****
Lensman Series	****
Foundation Series	****
The Baldy Series	****
Artur Blord Series	****
Mixed Men Series	***
Venus Equilateral Series	**
Johnny Black Series	**
Colbie-Deverel Series	**
Universe Series	****
Ezwal Series	***
Asimov Robot Series	***
Commander Morton Series (Black Destroyer, etc.)	****
Idealist Series	*

There's probably more. But take a look at the topnotchers on the list. Peculiarly, a considerable number of them feature psychology—the development of action from the psychological considerations. Is that a trend in favorites or just a reflection of my own taste?

Whatever happened to the book jacket illustrations? The experiments with red in interior art work?

And for just an ordinary story with not too much projection of future science or future locale what story can you name to compare with Sturgeon's "Killdozer". There was a *story*.

In the April '39 issue you have an Editorial descriptively labeled "Jackpot". Can you put a name to the discoverer of the secret of Atomic Power now? We didn't know—couldn't suspect—then—.

By His Bootstraps—greatest time-paradox story.

Slan—The greatest superman story and still one of the greatest stf yarns of all time.

Dead Hand — powerful — mass psychology, mass psychology extended into duration.

And those others! Incidentally that list of great stories by Van Vogt in which the Clane series would be grotesquely out of place points up my contention that Van Vogt must return to his old style—for himself, for Astounding Science Fiction and for the readers.

For the readers!

How I wish I could live some of it.—Dale Tarr, 1402 Scott, Covington, Kentucky.

During the war we heard from readers in New Guinea, Guadalcanal, and most of the way stops of the Tokyo road. The magazine really did spread around!

Dear Mr. Campbell:

This can hardly be classed as a first letter, I have written once before, but it was sometime in 1935, so I do not expect you to jump for joy on hearing from me again.

The reason for breaking a long period of silence is to offer several strawberries, one or two small raspberries, and the humble point of view of a "Limey".

First of all, let me give you one criticism of a type not voiced in America. Astounding is far too hard to obtain in this dollar starved

country. My regular subscription gave out with the start of the war, and only a few anemic British reprints took its place. While in the R.A.F. I managed to collect a few American editions in Durban and Bombay, the magazine certainly gets around. On moving into Bengal, the supply gave out entirely and until my return home I existed on a starvation diet. I have at last managed to arrange a direct post subscription from the U.S.A., and now I'm trying to fill the war-time gaps in my collection.

Now is the time to hand out a few bouquets. The new size of the magazine is perfect, both for the pocket and for fitting into my bookcase. The cover layout with the reduction in Astounding is even better. The stories are well on the up grade, although there seems to be undue (?) stress on the possible effects of the A-bomb. Personally, I'm getting a little tired of the tattered, mutant ridden remnants of civilization and their struggles to rebuild. Articles on the bomb come under a different heading, I rather like them, but please keep to one article per issue.

Now for the art work: The June issue with cover and interior illustrations by Schneeman not only looked good, but lived up to expectations. Bring back Schneeman and keep him, even if not in time to illustrate the rest of "Children of the Lens". Alejandro turned out a grand cover for September and was ably supported by the Bonestell effort in October. Sad to say Rogers has lowered the standard with his Neanderthal Lensman this month.

For the interior, Schneeman first and foremost. Cartier is better for *Unknown*, he is an excellent artist, but doesn't seem to fit Astounding. Orban is all right, but Timmins. Davis and Bernbach should be designing adverts for the backs of bus tickets. Swenson . . . it would be kinder to give him back his brushes and shoeshine outfit. Stick to Schneeman, Orban, Rogers and maybe Cartier and you can't go wrong. In case you think this is a lot of fuss to make about a few pictures, don't forget that goods sell primarily on their wrappers, after that they can prove their own worth. A bad wrapper—or picture—puts the goods—or story—at a psychological disadvantage.

Before closing. I would like to wish you the best of everything for Astounding, may its shadow never grow less. I would also like to thank you, Mr. Campbell, for shaping the mag into its present form. Congratulations, and though I may be a trifle early, A Merry Christmas. —B. T. Jeeves, 38 Sedan Street, Sheffield 4, England.

If the Neutrino detector involved the use of a diamond, or involved a magnetic field of 50,000 gauss, still the Pile couldn't be shielded!

Dear Mr. Campbell:

My evaluation of the December issue's stories is as follows:

1. "The Dreamers"—Yamin. I appreciate a few stories of this sheerly emotional type, though I wouldn't

care for a heavy diet of them. Wonder if most new writers—he *is* a new writer isn't he?—start out with these intense and somewhat introspective tales somewhat narrow in scope?

2. "Children of the Lens"—"Doc", the old master, seems to be a devoutly religious fellow. Or should be. His segregation and characterization of the abstracts "good" and "bad" are much too sharp to be real.

3. "Aesop"—Simak. There's one big hole in his scheme. Now all the cobblies migrate to the old earth, leaving Jenkins and party with a new world, to be sure, but practically annihilating the old one.

4. "The Barbarian"—van Vogt. This whole series seems to be declining, despite the attempts at complication.

5. "Age of Unreason"—the one story which should have been omitted. I can easily visualize it—after application of varnish remover and sprinkled indiscriminately with exclamation points—in one of the common s-f mags.

The September cover, by the way, was superb—to use a much-abused term. I would like to see a black & white sketch of that nature replace the contents-page spaceship. Really more appropriate, don't you think? As for your neutrino detector as an aid to the UN, I am not too excited. For if the neutrinos can be detected, then it necessarily follows that they can be stopped. A concealed pile could then be shielded.

I can't resist adding my comment to Xeno's "paradox." All the poor fellow's troubles started when he assumed indefinite divisibility of "space" without attributing the same quality to "time."—Warren D. Rayle, 2322 Delaware Drive, Cleveland Hts. 6, Ohio.

Ah, yes—Finagle's Constant. One of the few variable constants.

Dear Mr. Campbell:

Your editorial in the December issue was very interesting, but you failed to clarify one point which I think deserves your consideration.

I'm referring to the "mathematical bugger factor", long known to college students under the name of "Finagle's Constant". This constant is one of the most fundamental constants in the universe. Consider, not only does it simplify long, involved, laborious calculations, but it also is capable of ethical operations—such as the difference between right and wrong.

Anyway, the main point of this epistle is to announce that I have finally reduced Finagle's Constant to the following equation:

$$K = x^7 + 48x^6 + 2x^3 + 1/x + 29 + \int_0^\infty e^x y \, dx$$

where y is the sum of the infinite series

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \ldots\ldots\ldots$$

This can be simplified down to $K = \frac{Q}{2}$; where Q is a function of M.

To put my Earth-shaking discovery into English, for the benefit of the layman, it is simply this: Finagle's Constant is a *variable*.

I could go in to this in greater detail, but as my latest book "Morality, Business Ethics, and the Fourth Dimensional Hyper-schlumff" will be published any year now, I will simply refer you to Chapter 37 of Volume II of this epic work.

At this point, I would like to silence critics of the New School of the Ballet by reminding them that all that glitters is not Van Vogt.

Denials of the efficacy of Finagle's Constant are LIES, ALL LIES! By null-A logic, the whole thing is perfectly clear. Chapter 9 of the Necronomicon expresses my own thoughts on the topic perfectly.

I invite anyone who thinks he can disprove this to try.—Joe Schaumburger, 1822 Bathgate Avenue, Bronx 57, New York, N.Y.

IN TIMES TO COME

Of course, the prime item for next month is the second part of Jack Williamson's ". . . And Searching Mind," and it makes prediction a little difficult. I can't determine which of two rather long novelettes will fit in with it until I have them set in type. But there's "The Obsolete Weapon," by L. Ron. Hubbard, and "The Rull," by A. E. van Vogt that'll be coming up soon, anyway. The Hubbard story is an item concerning an American G.I. in Italy who strayed a bit from his post. Strayed a couple thousand years, in fact—

"The Rull" is, in essence, a continuation of the background van Vogt used in his two stories about the Ezwal, "Co-operate Or Else" and "Second Solution." The Rull, briefly mentioned in those yarns, becomes the central factor in this story—and with an interesting proposition concerning possibilities of alien life-form evolution. We've encountered, here on Earth, life-forms that specialized into fantastically narrow paths, and the generally unsuccessful result to the race. Van Vogt's got a new suggestion.

As I say, I can't guarantee which of the two will appear next month, but I can guarantee that the cover next month will be one of the finest pieces that any magazine ever carried. It's another Alejandro cover, and really shows only two heads. But it's a genuinely magnificent piece of work. This is one time when one can very truthfully say that the cover alone is worth the price of admission!

Also, for electronics, radio, artillery, mathematical, and mechanical—Goldberg type—fanatics, we have an authoritative two-part article coming up on how to build a robotocidal robot. Ex-G.I.'s will recognize the designation M-9; others will be interested in this anlysis of the problems of making a robot fire director that sees the enemy, interprets what it sees, adjusts a robot gun to point properly, and launches a miniature robot to destroy it. When its target was—as it often was—a V-1 robot buzz-bomb, it was a one hundred per cent robot war from both sides!

THE EDITOR.

. . . AND SEARCHING MIND

BY JACK WILLIAMSON

Illustrated by Rogers

***Part II** of III. A handful of strange, abnormal people who alone could fight the terrible over-helpful mass of the robots —with a child as their strongest fighter to free humanity!*

Synopsis:

Dr. Webb Claypool was only a distinguished astrophysicist, when the Crater Supernova flamed out in the sky. He and Ruth were on their honeymoon, the night he first saw it, but he broke off their plans and hurried back to Starmont to make his observations. Ruth cried over it, and never understood. But he studied the cruel sudden splendor of the star, and found the clue he wanted—to the new science of rhodomagnetics.

That new science created Project Thunderbolt—a secret weapon whose self-guided missiles detonate matter into destructive energy. It also wrecked his digestion and slowly blighted his happiness with Ruth, because Project Thunderbolt became an intolerable burden.

Claypool was at work on those

planet-shattering missiles in the hidden underground launching station at Starmont, when a little girl spoke to him, and handed him an unexpected invitation to call on one "A. White, Philosopher."

The child escaped, without explaining how she had entered that secret arsenal, through the locked and guarded gates. Baffled, Claypool obeyed instructions in the note, to visit the abandoned Dragonrock Light. There he found the child, Dawn Hall, with White and three other students of psychophysics. White was a huge, red-bearded, angry man, grimly waging a strange war.

Dawn, White explained, came to Starmont by teleportation. Graystone, an alcoholic stage magician, is a telepath. Overstreet, rescued from a mental hospital, is clairvoyant. Lucky Ford, a shrewd-eyed little gambler, was manipulating his dice by telekinesis. White had gathered and trained this singular group, for his desperate crusade.

He was fighting the humanoids.

The humanoids, White warned Claypool, are small android mechanicals, driven and controlled by rhodomagnetic beams from the relay grid of a central mechanical brain on the far planet Wing IV. They were made to stop war. But their maker, an engineer named Sledge, built them too well.

"They're too efficient," White told him. "Too perfect, and too benevolent. They have spread from world to world, across the inhabited sections of the Galaxy, forever blindly obedient to the Prime Directive—To Serve and Obey, and Guard Men from Harm."

Overstreet's prevision, White warned him, had seen the humanoids coming here next—to protect this planet from the technological crisis caused by such discoveries as Claypool's. White had been developing mental weapons to fight the humanoids, but they were not enough, and he needed a rhodomagnetic engineer.

Claypool refused to join him, however, because of his responsibilities at Project Thunderbolt, and the new mechanicals arrived in their great interstellar ships from Wing IV. At first they were welcomed, but when Claypool returns to Starmont after they are established, he finds bitter disillusionment.

His precious observatory has been demolished, because the overzealous mechanicals rule that scientific research is now too dangerous for human beings. His wife, Ruth, has been given euphoride, a drug of forgetfulness, because she seemed unhappy. When Claypool protests, the humanoid suggests that he will be happier if they remove his own memory—for men now have no need to remember.

The secret of Project Thunderbolt has been kept from the humanoids. Now, Claypool resolves, he must reach the concealed vault under the old search building, to fire a planet-smashing missile at Wing IV and so free men from the smothering care of the new mechanicals.

Appalling difficulties face him,

however. The watchful, blind machines, quicker and stronger than any man, never leave him for an instant. All the civilian technicians who used to man the project have been drugged with euphoride and sent away.

Desperately in search of aid, Claypool finds only one man left at Starmont. That is Frank Ironsmith, the brilliant but cheerily indolent young mathematician who had been employed in the computing section to do the laborious routine calculations for the observatory and the military projects. But Ironsmith, oddly, seems to like the humanoids.

And the little machines unaccountably exempt Ironsmith from their suffocating care. They even let him smoke his pipe—though Claypool has been told that fire is too dangerous for human use, and tobacco too injurious.

Ironsmith rides alone about the mountain on his rusty bicycle, and lives alone in his shabby old rooms at the computing section. Claypool visits him there, bitterly envious of his inexplicable freedom, and sees chessmen set up in an unfinished game—with no opponent visible.

Reluctantly, Claypool abandons his first shocking suspicion that Ironsmith is really a disguised mechanical. He fails to understand Ironsmith's apparent contentment, or his unfair freedom. Baffled and shaken, he abandons all hope of getting any help from Ironsmith.

Who, he wonders, is Ironsmith's chess opponent?

Part 2

XII.

Frank Ironsmith was a friend of the mechanicals, and, therefore, an enemy. Yet he was still a man, among all these too-perfect and too-benevolent machines. Claypool was sorry to leave his cheery, sunburned grin, and the comfortable little island of familiar things that he had preserved in the midst of all this bright, bewildering newness.

With his two black keepers close behind, Claypool came reluctantly down the narrow gravel path, through the old familiar evergreens. Sick with an envious longing, he paused to look back at the old, red-shingled building where Ironsmith lived, with its familiar wooden door that a man could open.

Ahead was a sea of strangeness. Instead of common gravel, there were smooth new walks, too level and too straight, made of something that yielded warmly to the feet. Instead of the old evergreens, there was that rank new garden of queerly writhing weirdness. Instead of the proud, aluminum-colored dome of his old observatory, the great new villa stood blue-and-golden in the sun, a splendid, spacious prison.

A sudden panic took hold of his throat, when he saw once more how all of Starmont had been transformed. Walking unwillingly between his keepers, he let his anxious gaze range northward.

He tried to find the squat old

concrete building of the search project, which had been set up to conceal Project Thunderbolt. But he saw that it would be hidden from him now behind the long amber walls of the villa—if it still stood.

For he was seized with a suffocating dread, that the busy machines might have razed the old search building, in the course of their reconstruction, and so stumbled upon the rock-hewn vault which held the secret weapon. But he dared not even turn aside, to look again—his blind keepers were too close and too watchful. Shuffling forlornly between them, he must have betrayed his sharp unease.

"You do not appear very happy, sir," pealed a sudden golden voice. "Perhaps you need euphoride, to help you forget—"

"No, I'm happy—quite!" he interrupted hastily. He wet his lips, and gulped at the dusty roughness in his throat. "It's just that things are different, now. A man needs time to think."

"Men no longer need to think."

Claypool shuddered from that cheery purr. For he had to think out a way to reach that buried vault alone, and press the key to smash Wing IV and stop the humanoids. Clearly, he could expect no help from Ironsmith—even that dinner invitation, he suspected bleakly, might turn out to be some kind of trap. No possible aid was left. Unless—

His plodding steps halted suddenly.

"At your service, sir," whined the machine beside him. "Has something disturbed you, sir?"

He caught his breath, and made himself move on. The sharp conflict of hope and terror made a hard tightness in his fluttering stomach. Blood pumped loud against his ears. He walked on for a dozen yards, before he dared trust his voice.

"No, I'm quite all right"—he kicked at a pebble on the gravel path, to show his unconcern—"but a man needs to talk to his friends. I've just thought of an old acquaintance I'd like to see. I wonder if you can find him for me?"

"What is the name, sir?"

"White. Mr. A. White." Claypool's voice came too high, and he paused to frown as if with effort. "I don't remember his last address, but he was living somewhere on the west coast. A big, blue-eyed man, with a thick red beard. A professional philosopher. I'd like to find him."

Yet he decided to say nothing of the old Dragonrock Light, where he had gone to see White and his strange disciples. For they might be hiding there still, seeking their weapons of the mind to turn against the humanoids, and he didn't want to betray them. He turned to watch the small machine.

It stood frozen. The sun struck its sleek blackness into molten bronze and frosty blue. Its eyes were smooth steel orbs, opaque and blind and yet alert. He shivered inwardly. For Ironsmith had been with him at Dragonrock, and heard White's plans. Had he sold out White, to buy his freedom?

He waited, and the machine answered:

"There is no such individual among the men we serve on this planet, sir."

Then he felt a difference in the sleek humanoid. Its narrow silicone face was still mildly astonished and intently benign. Its voice was still golden music, its steel eyes still blind. Yet he felt a new taut something, a veiled and dangerous intensity which frightened him.

"On other planets, however," it purred gently, "we have several times encountered a very large man, who always wore a thick red beard and often called himself a philosopher and sometimes used the name White. His present whereabouts are unknown, because he took part in an unwise attack against Wing IV, and fled when it failed."

Claypool felt that hidden alertness tighten.

"Where did you know this man, sir?" murmured the machine. "And when?"

With a careful unconcern, Claypool kicked the pebble again.

"I never knew him well." He paused to control his voice, and tried to undo his blunder. "I met him at some scientific gathering on the west coast, when he read a paper on his philosophy. That was a number of years ago."

He felt that searching attention relax.

"Then the man we seek is a different Mr. White," the machine whined sweetly, "because he last escaped us only three months ago, on a planet four light-years from here. But he is unhappy, and he needs our care."

Claypool walked on again, deliberately.

He hoped his blundering inquiry wouldn't be fatal to White, because this revelation gave that red-bearded giant a new heroic stature in his eyes. White loomed tremendous now, the last tragic champion of all men against the humanoids. But Claypool dared not try again to reach him, for one more ill-judged query might betray him.

Conscious of the two alert machines beside him, Claypool stooped desperately to pick a tattered yellow bloom from a weed beside the path. Its pollen made him sneeze, but he eyed it with a resolute pretense of casual interest, and walked on toward the villa.

Hopefully, he looked for the old search building again. Still he couldn't see it, but his narrow shoulders stiffened stubbornly, and he tossed the yellow weed defiantly away. He had found no hope of aid, but he didn't mean to quit.

The humanoids had to be stopped!

Back at the villa, he let the trim machines guide him through the two vast wings. He tried to appear delighted with all the mechanical wonders of that stately and commodious prison. Vast crystal windows turned opaque or luminous at need. Roofless gardens were tropical with radiation heat. The kitchen was an antiseptic laboratory. And every device, he bitterly observed, was worked by rhodomagnetic relays, concealed from human reach.

Restless as any trapped animal, he wandered on.

He didn't like the swaying, nightmarish half-plants in the sunken garden beyond the villa. Their hot rankness made him sneeze, and turned him faint with illness. But he walked on around them, with a determined show of curiosity, just to reach a spot from which he might see the old search building.

He scarcely dared to look, even when he was near enough. For his two little keepers were always too near, their blind steel eyes too alert, their black handsome faces too impassively kind. His knees felt weak, and his breath came too fast again.

But he turned to climb a little rocky point, near the lip of the basalt precipice which dropped straight from the flat crown of the mountain to the talus slope and the desert, nine hundred feet below.

"At your service, sir." A tiny mechanical glided silently to block his path, lustrous in the sunlight and ruthlessly benign. "It is too dangerous, sir, for you to go so near the edge."

He nodded, not protesting. Assuming an idle interest in the flat brown waste beyond the tumbled debris of six-sided basalt prisms, he let his gaze slide northward. Carefully casual, he swept a jutting buttress of the mountain, and the flat slope above.

The old squat building stood intact!

He made his anxious eyes move on instantly, away from the flat ugly dome of it. Yet he had time enough to see that the tall steel fence and the guard towers of the old military installation had been torn down. There was nothing to keep him from the building—nothing except the humanoids.

He stood looking out across that tawny waste with its white slashes of dry washes and wrinkles of far brown mountains, not seeing anything. Five minutes would see the end of the humanoids, he thought, once he got into that building alone.

A heavy rumbling vibration drew his glance again. He looked past the low gray building, careful that his eyes didn't pause. And he found the excavating machine.

A monstrous mechanism, it held his gaze, and checked his heart. The whole mountain shuddered beneath it. The clean, functional lines of its armored case gave it a kind of ominous beauty. Red enamel and white metal glittered painfully under the desert sun. Its massive jaws rumbled, crushing stone.

On immense slow tracks, it was creeping through the flattened ruin of the old guard barracks. Its huge shining blades were slicing the grassy mountain crown into a long red dike of raw soil and broken stone. The search building, he saw, would stand in its way.

He tried to conceal his instant alarm, but the intent mechanical beside him must have followed his eyes and half his thoughts, for it purred apologetically:

"Unfortunately, the landscaping of Starmont is not quite complete, sir. The dense substratum under the north end of the grounds has

delayed the work, but it should all be finished in a few days, sir. We are going to remove all the old military buildings, and excavate the entire area for a pool."

Claypool contrived a bleak smile. "That's wonderful." He dared not protest that he didn't want a pool, although he could see that this huge slow mechanism would soon smash through the old search building and uncover the installation beneath it. He must strike soon—or never. Faintly, he managed to say:

"We used to swim every summer. Ruth and I."

Gently the humanoid reminded him, "Swimming is forbidden now."

He couldn't help retorting bitterly, "For Ironsmith, too?"

For an instant, it stood completely motionless. The driving sun struck and flowed in molten metallic sheens over its shining blackness. Claypool bit his lip, afraid his words had revealed too much of his own taut and bitter anxiety.

"Mr. Ironsmith," the mechanical droned abruptly, "has earned a different status."

"How?"

The graceful black machine stood frozen again, for long intolerable seconds. Its dark benevolent face regarded him with a faintly astonished vigilance. Suddenly its clear voice pealed:

"At your service, sir. Such questions tend to show unhappiness, and now we observe that you are squinting. This sunlight is too bright for your eyes. You should return to your dwelling and eat your lunch."

Claypool put up a thin and desperate hand to shade his eyes, fumbling for a ruse. Perhaps he could manufacture some excuse to send one of his keepers away, and then knock out the other with a rock—better, push it off the cliff. Perhaps he could reach the search building, before the others came. Perhaps—

"The sun's pretty bright," he admitted cheerfully. "But I'm not hungry yet, and I want to see the rest of the grounds." He peered hopefully at his nearest keeper. "So, if you'll just go back to the house and bring me a pair of sun glasses—"

The machine didn't move.

"At your service, sir," it whined. "Another unit will bring your glasses and a parasol."

"Fine," he muttered. "Very fine indeed!"

He walked on again, obliquely toward the low concrete building, keeping as near the brink of the precipice as his guards would allow. He began picking little blue wild flowers, looking for a likely stone.

He found one at last, and his fingers closed on it. He tried to cover it with the flowers he had picked. His muscles tightened, and his heart thumped painfully. He knew that he would have to be fast, that the fate of man was in his grasp—

"At your service, sir!"

Beamed power made the small machine a dark blur of motion. Its

steel-and-plastic fingers took the stone out of his fingers, with a ruthless careful strength.

"That object is too dangerous, sir," it purred gently. "You might injure yourself, attempting to lift such a heavy stone."

Claypool straightened slowly, peered into its gray steel eyes. Its dark graceful face held a calm benign serenity. It was perfect and invincible. He shrugged bitterly, and turned away from it. His pathetic ruse had failed, as it seemed that men must fail forever. Wearily, trembling with a nervous reaction, he turned back toward his shining prison on the hill.

XIII.

Waiting for the time to dine with Ironsmith, Claypool felt a sick desire to see his wife again. Yet he was afraid to return to that gay nursery room, where he had seen her building up her plastic blocks and crying when they fell. His control was too fragile. Too easily, he might let compassion for her break through, and betray his hatred of the humanoids, and so invite oblivion.

Tired, he tried to relax. He surrendered his person to the efficient machines, and they washed him in a perfumed bath, steamed him and massaged him and clad him finally in a soft white robe.

He didn't like the robe. It fastened in the back with tiny rhodomagnetic snaps which he couldn't reach or work, and it made him feel ridiculously unclad. He asked meekly for his trousers, but the machines told him they had been destroyed.

"They had been worn, sir. They were no longer sterile."

He said no more. He wasn't seeking forgetfulness. The expert rubdown had relaxed his body, and his mind was absorbed in a resolution to find the key to Ironsmith's special status, and earn freedom of his own to reach that firing key. His thought was shattered by a cheery drone:

"Your body needs attention, sir. It already shows defects due to age and overwork and the want of proper care. Your muscular tensions indicate continued worry, which ought to be relieved. We must advise euphoride, sir, without any long delay."

"No!" Claypool's voice turned sharp, and he felt those familiar tensions drawing him dangerously rigid again. "I'll be all right," he insisted stubbornly. "Ironsmith is going to help me get adjusted."

"The treatment may be delayed until you have seen him," the little machine conceded. "But such tensions as yours are not easily relieved."

Waiting for the time to go, he sat on a wide terrace at the villa, watching the desert redden in the misty dusk. The cruiser ready on the stage was a long smooth egg, bright-streaked with reflections of land and sky. A little humanoid, far beyond, was guiding a humming lawn mower. The whole scene was quiet enough, but he could feel the silent alertness of the two silent

guards behind his chair, and his thoughts moved in defiant rebellion.

He nursed a smoldering resentment against Ironsmith. He had never quite approved of the younger man's unpressed slacks and his untidy hair, his rusty bicycle and his chewing gum, his idle reading and his commonplace companions. For scientific scholarship, to Claypool, had been a kind of high religion, with its own hard discipline. The easy-going, callow-minded hack in the computing section had always seemed to lack that stern devotion.

And Ironsmith loomed up now as a monstrous enigma, more able and more dangerous than he had ever guessed. Bleakly, Claypool wished again that the other had turned out to be a second Major Steel—that would have been at least a comprehensible answer to the riddle.

"At your service, sir," came the sudden voice behind him. "It is time for you to go."

Even that gentle purr made him start up nervously, for his thoughts of Ironsmith had grown into brooding apprehension, and he faced the evening with an uneasy dread. He hurried silently across the red landing stage, and the two guardian machines helped him carefully up to the long covered deck.

Watching through the hull's dark transparency, he saw Ironsmith pedaling along down the path from the old computing section, bareheaded in the cool dusk and whistling cheerfully. A pang of envy stabbed him.

It simply wasn't fair.

For Project Thunderbolt had become a kind of secret shrine, to a god of awful vengeance, and Claypool felt that he was not the master of it, but only a chained altar slave. His own hard duties in that hidden vault had long ago wrecked his digestion and blighted his marriage and soured his disposition. Now, when his cruel vows were calling him back again, perhaps to sacrifice his memory or his life, it seemed bitterly unfair for Ironsmith to be so blithely young, so idly free and irresponsibly lighthearted.

Ironsmith leaned his cycle against the villa wall, and ran lightly to the cruiser. The deck was chest-high, with no step or ladder. He asked no aid, however, and the mechanicals offered none. He vaulted easily aboard, and sank into the deep seat beside Claypool with a genial grin.

The door closed then, and the cruiser rose silently. As the mountain dropped back into the thickening dark, Claypool risked another glance at the old search building. It still stood—but the digging machine, carving long slow slices from the mountain, was creeping steadily toward its secret.

Claypool resolutely made his eyes move on, and he turned to Ironsmith with a guarded wariness. But the younger man didn't behave like an enemy. He had left his pipe behind, as if from courtesy, and he offered Claypool a stick of chewing gum.

"It helps," he urged, "if you can't smoke."

Then he began pointing out the

luminous roofs of new villas scattered across the dark plain beneath, and talking brightly of the tunnels the humanoids were boring, and pumping stations they were building, to divert whole rivers to this arid plateau.

Claypool chewed his gum distastefully, tautly alert.

The little ship lifted out of the twilight at Starmont, and curved high through the violet blackness of the ionosphere to overtake the setting sun. It slanted down again, toward the dark and jagged edge of land against the bright hammered copper of the sea.

A stark granite headland flung up at them. Red sunset shimmered on the wet black stones of a broken causeway. White spray plumed up from sharp black rocks. Claypool blinked at his pleasant-faced companion, and peered again.

"I call the place Dragonrock," Ironsmith was murmuring, "after that old light that used to stand here."

Claypool nodded, suddenly cold and ill. Why had he picked this certain spot? What had he done with the curious fugitives hiding in the old tower—White and his disciples? Claypool shivered to his bleak apprehensions, but he dared not utter such questions.

"Pretty wonderful, isn't it?"

Ironsmith was beaming innocently, and Claypool turned dazedly to survey the bright new castle crowning that dark headland. Golden columns and balconies and clustered towers made a luminous filigree too elaborate for his taste, and high roofs burned crimson.

The craft settled lightly on a wide landing stage. The machines opened the door, and helped Claypool alight. Ironsmith sprang down unaided, and took him to tour the monumental halls and the exotic gardens sheltered from the cold sea winds by crystal parapets.

"Pretty gorgeous, don't you think?" Ironsmith said happily. "I'd like to live here, if I had time."

Claypool eyed him narrowly, wondering. What else had he to do? How did he earn his singular freedom? Claypool blinked angrily at his own silent guardians. A blaze of irritation swept him, and he blurted suddenly:

"Can't you send them away—so we can talk alone?"

To his stunned surprise, Ironsmith nodded calmly.

"If you like. I'm afraid you let their presence worry you too much, and perhaps I can help you accept them." And he turned quietly to the two machines. "Please leave us alone for half an hour. I'll be responsible for Dr. Claypool's safety."

"At your service, sir."

Obediently, the two keepers departed. Claypool gasped with an incredulous relief, and then he looked hard at Ironsmith. He saw only a lean, youthful man with honest, friendly eyes, but something touched him with icy awe.

Ironsmith beckoned cheerfully, and led him on across the soundless pavement of a vast court. The

heated air was bitter with a dark fragrance from huge crimson fungi, fringed and intricate, which towered out of tall golden jars. A crystal wall stopped them, and white surf was moaning over black rocks far below.

Claypool caught his breath, and plunged vehemently.

"Frank, I want to know what happened to White and that child and the others?"

Ironsmith's gray eyes turned sober.

"I don't know," he said slowly. "I came here looking for them, and found the old tower empty. I selected this for a building site, hoping they might return. But they didn't, and I never found a clue."

Claypool saw the other's urgent purpose, with a bleak amazement. For this was not the callow and indolent youth he had known, but a mature, determined man. That low, calm voice had a force and confidence which unnerved him. Bitterly, he gulped:

"Why try so hard?"

"Because White is an ignorant fanatic." That soft voice had a crushing certainty. "Because his blundering attacks on Wing IV can do a vital harm."

Claypool's face set grimly.

"If he's against the humanoids, that's enough for me."

"That's why I brought you here—to warn you." Ironsmith's eyes were level and cool and a little sad. "Because I want to save you from making White's old blunder. Your whole attitude is mistaken, Claypool, and dangerous."

Claypool shivered.

"That drug, you mean?"

"No, it's something bigger than that," Ironsmith said softly. "In fact, I think you ought to ask for euphoride. Because it's useless to fight the humanoids. You can only hurt yourself—and others. You might as well let them help you."

Claypool said nothing, but his narrow jaw set hard. He stared out at the ruddy light dancing on the sea, wondering how to ask what he had to know.

"The big danger is from White," Ironsmith went on gently. "I believe he will try to get in touch with you. If he does, please tell him to come to me—before his mad plots have plunged us all into catastrophe. I want a chance to show him that he's on the wrong side. Will you pass along that message?"

Claypool shook his head. He caught his breath, and tried to shrug off his uneasy dread of this inexplicable individual, who had been only a clerk at Starmont.

"Ironsmith, there are things I've got to know." His voice had a breathless harshness. "Just how do you get on so well with these machines? Why are you so worried about White's fight against them? And who—" His voice caught. "Who's your chess opponent—when you're all alone?"

Ironsmith gave him a brief, sunburned grin.

"Your imagination is working too hard. Really, I think you had better ask for euphoride."

"Don't say that!" Claypool's voice turned husky, and he clutched desperately at the other's sleeve. "I know you can help me—you've escaped the drug." His tone became a frantic mumble. "Please . . . please, Frank . . . be human!"

Ironsmith nodded sympathetically. "I'm trying to help you—if you will let me."

"Then tell me—" His voice shook. "Just tell me what to do!"

"Accept the humanoids," Ironsmith said softly. "That's all I did. If you will do that—actually—everything else will come. If you don't, nothing else will help you. And I'm afraid that's all I can say."

"Frank!" Claypool clung to him, frantically. "I know there's something else. Please—"

But Ironsmith's calm gray eyes were looking back across the court again, past the bitter-odored fungi in the tall yellow jars.

"They're coming back," he murmured. "So I'm afraid we've no more time. I hope you remember my message for White. But you really should try to accept the humanoids. They were made, you know, to protect and aid and obey mankind."

Inwardly shivering, Claypool watched the two tiny humanoids come running gracefully back across the court, to resume their intolerable watch. He turned shakenly between them, to look back at the fading crimson on the sea.

He'd accept them, he thought savagely, with a shot from Project Thunderbolt. He couldn't understand why such a man as Ironsmith had turned against his kind, even to earn his freedom. But the humanoids—somehow—had to be stopped.

"At your service, sirs," came a sudden silver peal. "Your dinner is served."

As they turned back from the transparent parapet, Claypool swept the other with a penetrating glance. To the eye, Ironsmith seemed a very ordinary man. His pink and open face showed some slight preoccupation, but he was busily chewing his gum and brightly interested in the waiting dinner.

XIV.

The vaulted hall where they dined had a spacious splendor which only television producers had imagined in the vanished past, before the humanoids. Six mechanicals served the too-elaborate meal. There were wines for Ironsmith, but none for Claypool.

"At your service, sir," a machine whined melodiously. "But your health has been impaired by worry and fatigue. You must take no alcohol until you are better."

It was serenely right, and intolerable.

When the meal was done, Ironsmith announced that he was staying for the night, and Claypool went back to Starmont alone. Aboard the silent cruiser, soaring above the atmosphere, he ignored the crystal beauty of the stars. He sat hunched on the edge of the luxurious seat, with his chin in his skinny hands, sunk deep in dismal failure. Ironsmith had proved himself both enemy and enigma. White had disappeared. He was left alone and he saw no hope.

"At your service, sir," murmured the keeper beside him. "You appear uncomfortable."

"Huh!" He tried to check his nervous start, stretched himself deliberately, and relaxed carefully in the deep seat. "No, I'm quite all right."

He grinned stiffly at the two dark identical faces above him, out of an irony of nightmare. He knew, now, that he was trapped. No action was possible. These perfect and eternal keepers of mankind were pure benevolence, and more dreadful than anything evil.

They prohibited even the freedom of despair.

At the end of the flight, he chanced one more glance toward the old search building. A flat gray dome, beyond the glowing, graceful walls of the new villa, it was still intact—and as far from his reach as Wing IV itself. But the digging machine was nearer to it now, a slow metal saurian, devouring the mountain in the dark.

Claypool started awake, out of a troubled dream.

"Dr. Claypool! Please—can you hear me?"

A clear childish treble was calling to him, urgent and afraid. At first he thought that tiny voice was only a part of the dream. But something brought him up in the bed, suddenly wide awake, taut and shivering.

His dream had all dissolved, less vivid than this waking nightmare of mankind smothered under the absolute benevolence of the humanoids, but the terror of it had left

rough pimples on his skin. He peered around him, trying to shake off a sense of helpless suffocation. For he was safe in his own new bedroom, here in the east wing of Starmont.

Quiet was here, comfort, and utter peace. In the softly glowing murals, village swains and maids danced silently at their unceasing festival. The vast east window, transparent now, opened upon flat desert and far folds of hills, washed now with chill blue dawn.

A tiny black machine stood beside his bed, alert and still as all mechanicals not at work. Its blind tranquility brought back all the helpless terror of his dream. He shuddered convulsively, and vainly strove to smile and hide his fear.

Then he saw that it had stopped.

It was falling, and it made no move to recover its balance. It toppled deliberately, still rigid as some statue of pure grace in black-lacquered metal. It struck the soft floor with a muffled crash and lay there, dark face up, incredibly stopped. And Claypool coughed to a sudden stinging reek of hot metal and burned plastics.

"Dr. Claypool!" He started again, and realized that the childish voice was not a dream. "Won't you come with me? Please!"

Then he saw her.

Dawn Hall! She crept timidly around the foot of the huge bed, peering uneasily at the quiet mechanical on the floor. That immense bright room was warm enough, and she was huddled in a worn leather coat much too large for her, yet he saw that she was shivering. Under a thin yellow dress, her bare knees and feet were blue with cold.

She was nine or ten perhaps, though long hunger had made her look too small and too old. Her eyes, sunken and shadow-circled in her pinched, grimy face, were huge and dark with dread. Yet she wore a bit of red ribbon like a flag of courage in her straight black hair.

"Huh—why, hello, Dawn!" He saw her terror, and gave her a pale feeble grin. She smiled back uncertainly, and came on to the side of the bed. Claypool nodded stiffly at the fallen humanoid, whispering:

"What happened to that?"

"I stopped it."

"Huh!" He peered at her thin, frightened face, and then back at that stricken unit of the ultimate machine. A dazed incredulity shook him. "How?"

Her frightened eyes stared at the thing on the floor.

"Like Mr. White taught me." Her voice was thin and breathless. "You just look, in a certain 'ticular way. Inside its head, you can see a white bead. That is—potassium." She formed the word very carefully. "You just look—that certain 'ticular way—and the potassium burns."

Claypool shrugged, with a numbed acceptance. He remembered potassium's unstable isotope, and White's statement that he had learned to control atomic probability, to detonate K-40 atoms by an act of the mind. Claypool had wanted to doubt that, but here was the stunning proof.

"Please—won't you come? 'Cause Mr. White says we need you very much. Won't you come and help us now?"

But Claypool hardly heard her piping, desperate voice. He was staring at her black, limpid eyes, so wistful and anxious and afraid in their dark circles of weariness and want. He felt a tingle in his scalp, and he couldn't stop his shivering.

For the human body, it occurred to him, also contained a fatal quantity of K-40. Old tales of the evil eye became suddenly something more than superstition. If this strange child could stop a humanoid by looking at it in a certain particular way, she could also kill a man.

"Please—won't you come?"

The meaning of her breathless words burst upon him then, and a wave of hope swept away the nightmare chains of total frustration. He shrugged off his momentary terror of her black solemn eyes, and smiled at her cheerfully.

For here was a friend, a weapon, a way to freedom!

"Please . . . Mr. White wants to know—"

And he scrambed out of the big bed, a slight anxious figure in a loose, blue night robe. He stood for a moment beside the motionless machine on the floor. Its handsome narrow face was still the same, faintly astonished and eternally benign. But now the steel-colored eyes were tarnished with heat, and thin blue smoke seeped from its nostrils.

He flinched from it suddenly.

"We must get away from it." He snatched the child's arm, surprised at how light and tiny she felt, and drew her quickly beyond the bed. "The rays from it," he whispered. "Still dangerous!"

He peered frantically about for a way of escape, blinking his burning eyes and coughing to the bitter smoke—even that might be laden with deadly radioactives. But the sliding doors and the huge window were all secured with rhodomagnetic relays, safe from human fingers. He saw no way out.

Unless—

The thought shocked him, like the cold touch of an unseen hand. Breath-taken, he stared at the child with smarting eyes. The throb of his heart was a hastening drum. He tried to collect himself again, and he heard her worried voice:

"—says we must hurry. 'Cause the black things will know I stopped this one, and more of them will come. Mr. White says we must come back now, if you are ready."

That acrid smoke had caught his throat, so that he could scarcely breathe, and hot tears blurred his eyes. He blinked at the child and put a numb hand against the smooth shining wall, to steady himself.

"How . . . how can we get out?"

"I'll take you," the child said. "Just come with me."

She put up her grubby little hand for him to clasp. It felt cold, and it was very thin and tiny. He could feel her shivering. He stared down at her.

"I don't understand."

"We go by teleportation." She was careful with the word. "Mr. Lucky can help, but still it won't be easy."

Claypool dropped her hand.

"Huh!" His dry laugh was almost hysterical, and the bitter smoke changed it to a coughing paroxysm. He mopped his burning eyes with the soft sleeve of his robe. "I can't do teleportation."

"Mr. White thinks we can carry you," she piped solemnly, "if you will help. You must think where we're going, and do all you can."

Shuddering, he tried to believe.

"Then where are we going?"

"It's a far, dark place, underground. It's always cold there, and you can hear water running. I don't like it—but the black things can't get in. Mr. White will help you find the way. He says we must try it, now."

Claypool took her hand again. He tried to picture some dark cave, where White and the rest of his motley followers would be hiding. His mind could see the efficient black machines swarming here to avenge that one on the floor. He longed, with a savage intensity, to escape this sealed room, and their smothering care.

Surely, he tried hard enough.

But he was a physicist. He couldn't quite imagine the mechanics of instantaneous translation. Even the swift rhodomagnetic missiles of Project Thunderbolt didn't quite reach infinite accelerations, and anything faster was physically impossible. He wasn't much surprised when nothing happened.

"Please—try!" The child's thin voice seemed strained and breathless now. "Harder!"

"I did." Claypool let go her hand, and his voice was a gasp of bitter failure. "I did—but I don't know how. I'm afraid it's all no use."

Her cold, tiny fingers clutched his again.

"You must—please!" she whispered desperately. "Mr. White says we can carry you—if only you will let us. I could move a rock as big as you. But you won't let us. You must let go. Try again—now!"

He tightened his grasp on her quivering hand. He looked at her black anxious eyes, and thought of White and Overstreet and old Graystone and little Lucky Ford, waiting in some wet, cold cavern. He thought he tried. But he knew that nothing would happen.

And nothing did.

The child's tiny fingers grew frantically tight, and suddenly relaxed, limp and trembling in his own. Big tears of frustration washed grimy streaks down her pinched blue face.

"Oh, I did try, Mr. White," she was whispering bitterly. "'Cause I know it's so important. We both tried. But we just can't."

And Claypool caught a flicker of motion, outside the great window. Something dark and very swift had just run past him. The machines were closing in.

He turned shakenly back to the little girl, and a sudden tenderness choked him. For a yearning mo-

ment, he wished that he and Ruth had found time for children—instead of Project Thunderbolt. He reached awkwardly for the child, to comfort her.

"It's all right, Dawn—"

But some cruel school had taught her a proud independence. She moved back from his clumsy arm. Her bare skinny knees shook with fear and cold, but the tattered ribbon in her hair was still a defiant flag.

"No, it isn't all right." Her voice was bitterly clear. "'Cause Mr. White says it is very bad, for all of us. He says the black things will take your memory, now. And he says they will know about us, 'cause I stopped that one. He says it will be very hard, now, for us to change the Prime Directive."

She stood a little away from him, tiny and indomitable. Her blue lips moved, murmuring silently. Her frightened eyes looked at something far away. Her black proud head tilted as if to listen. Then she turned back to him, sad and grave, and put out a small dirty paw.

"Good-by, Dr. Claypool. Mr. White says it's time for me to go, 'cause the black things are coming now. I'm awful sorry we couldn't—"

Claypool glimpsed another black machine, beyond her, darting past the window. An instant later, the wide panel turned opaque, shutting out the dawn. And the glow of the murals on the high walls was suddenly extinguished. Smothering darkness fell upon them, and he heard a terrified gasp from the child.

XV.

After one staggered instant, Claypool understood. The humanoids, with their rhodomagnetic senses, had no need of light. That efficient brain on Wing IV intended to bewilder him with darkness, while the swarming units crept in to seize him.

He wondered how forgetfulness would feel.

"I'm awful sorry." The child's thin treble seemed too loud in that crushing dark. "But Mr. White says I must go."

Her tiny questing fingers caught his hand for a moment, and then let go. For an eternal second he stood all alone in the dark, and the silence was creeping madness. Then sheer desperation armed him.

"Dawn!" he gasped into the darkness. "Wait!"

To his infinite relief, her tiny voice came back:

"I'm sorry, but Mr. White says—"

"Wait!" he sobbed again. "I know I can't go with you, but tell Mr. White I have another way."

He filled his lungs again, careless of the strangling fumes from the burned-out machine on the floor. His narrow shoulders lifted defiantly in the dark. He didn't understand that paraphysical stuff, but his mind could see the sleek and deadly missiles of Project Thunderbolt, gleaming on their racks beside the launcher in the vault.

He didn't know the mathematics of paraphysical translation, but

those long missiles were fast enough. Fleeter than light, they could cross space to far Wing IV in the time a man could breathe a prayer for freedom, and the rhodomagnetic detonator in one tapered case could ignite that planet like a nova.

Groping in the dark, the child caught the sleeve of his robe.

"Mr. White says maybe we can help you," she whispered swiftly. "But he wants to know your plan. 'Cause there are too many machines —more than I can stop."

The wonder of that struck him suddenly.

"How do you know?"

"Mr. Overstreet can see them," she said. "He can see us here, even in the dark." Claypool remembered the pale, myopic clairvoyant. "And I can talk to Mr. Graystone." He was the gaunt, alcoholic stage magician, the telepath. "Now Mr. White says we must hurry."

Hoarse with strain, Claypool's voice ran swiftly:

"Then tell him I have weapons—self-guided missiles already ranged and set for Wing IV—still hidden in that underground station where you came."

A dark apprehension shocked him.

"Unless the humanoids have already found them," he added uneasily. "Because I saw an excavating machine, working toward the old building."

"Wait," the child breathed. "Mr. Overstreet can look."

For an endless second the room was silent again, and he shivered to a dread of soundless black machines creeping upon them through the blackness.

"Mr. Overstreet can see the building," she whispered at last. "The digging machine has broken through the corner of it, but the roof hasn't fallen in. He says the black things haven't found the elevator."

A savage elation swept him up.

"Then we'll do it!" His rasping whisper was loud in the dark. "We must wait until the machines open the doors, to get at us. Then you must stop them, Dawn—as many as you can. And I'll make a run for the building. If I get there before it falls, I can stop the machines."

Silence seemed to thicken in the room again, until the dark was clotted. He knew that Dawn was listening. Her low calm voice, when at last she spoke, seemed so loud it frightened him.

"Mr. White says we may try your plan. He says he had hoped to change the Prime Directive, without wrecking all the black things. But we needed you to help do that, and we can't try it now. So your weapons are the only way, and he says I'm to stay and help you all I can. And he says—"

The child gasped faintly in the dark. Claypool felt her small hand tighten, where it clutched his sleeve. Frightened and breathless, she went on faintly:

"He says there's one great danger we must take—worse than all the black things. He's afraid we'll meet Mr. Ironsmith."

Claypool started, as if some unpleasant thing had breathed upon him in the dark. He had almost forgotten the sinister riddle of Ironsmith, but now all his resentful bewilderment at that cheery, friendly-seeming man fell back upon him, in a crash of dazing apprehension.

"Ironsmith?" he whispered huskily. "I've been wondering . . . why he likes the mechanicals so well . . . and why they leave him so free." He shivered in the dark. "Who is Ironsmith?"

He listened desperately, in the soundless dark.

"Mr. White says he doesn't know." Trouble slowed her voice. "'Cept he's against us. But he has others with him—others in far places." Claypool remembered those chessmen, set up in an unfinished game, and he felt a cold tingle at the back of his neck. "An' they all work to help the black things."

"Anyhow, I don't thing Ironsmith is here," he said hopefully. "He stayed last night at Dragonrock."

The tiny hand tensed, against his sleeve.

"He stayed to hunt for us." Dawn crept closer to him, and he could feel her trembling. "He tried to catch us in that old tower—he and his far friends. 'Cause they want to help the black machines."

Claypool nodded bitterly. Now he began to see the outlines of the monstrous plot. The humanoids, he thought, must have purchased the loyalties of a few human renegades. Ironsmith must have joined them—perhaps before he came to spy on Starmont. Probably Major Steel had bought him, with the promise of all the privileges and immunities he still enjoyed. Claypool's fingers twisted savagely, hungry for the smiling traitor's throat.

With a puzzled regret, the child was saying calmly:

"I was awful 'sprised, about Mr. Ironsmith. 'Cause he seemed so nice and kind, when he came to Dragonrock. He talked to me and gave me gum to chew. I liked him then, but I guess I was awful wrong—"

She broke off suddenly, to listen in the dark.

"Mr. White says we mustn't wait any longer." Her voice was breathless. "'Cause Mr. Overstreet can see them on the roof, fixing the ventilator to blow something in—something to make us sleep."

Urgently, she pulled at his sleeve.

"But we can't get out!" Claypool swayed to that shock of disaster. "They've got us trapped, till they want to open the door—"

"Come on." She tugged sharply. "Mr. Lucky can open it."

"But how can he, when he isn't even here—?"

Claypool swallowed hard. Shivering, he peered around him in the dark, looking for that gnarled and withered little professional gambler, whom he had seen squatting by the fire and absently practicing telekinesis with a pair of dice.

Because the door was opening.

As smoothly as if a rhodomagnetic impulse from some humanoid

unit had tripped the hidden relay, the wide panel slid silently back. Shadowless light flooded the room, from the hall. But Claypool couldn't find Lucky Ford.

Gravely, the child explained:

"Mr. Lucky isn't here. But he can reach the lock, and Mr. Overstreet helped him see what to do. Mr. White says tell you that extra-physical effects are not functions of physical time or physical space. He says the telekinetic effect—"

She was struggling bravely with the long words, but Claypool didn't wait to listen. A slight barefoot figure, brown and awkward in the loose blue gown, he darted frantically out into the great hall of Starmont, where niches in the lofty walls were windows on many worlds. And a voiceless alarm sent him staggering backward.

At the end of the hall, two small black machines darted into view. They came running silently, with a terrible blind agility. One of them held a tiny bright object—a hypodermic needle, Claypool thought, probably loaded with euphoride. The other reached into a flapping bag strapped to itself, and started to throw something.

Instinctively, Claypool had pulled the child behind him. She looked past him with her dark sad eyes and dread chilled him—for the running humanoids stiffened suddenly. The one with the bright object turned a grotesque cartwheel. The other skidded on its face, and a little gray cloud exploded from the thing it had tried to throw.

"We must hurry." Dawn tugged at Claypool's sleeve. "'Cause Mr. White says that mist would make us sleep."

The warm feel of the floor reminded Claypool that his feet were bare. He wanted his shoes, and he glanced desperately back into that huge room. He couldn't see any clothing—the efficient machines must have stowed his shoes away somewhere—and he had no time to search. He caught the child's hand again.

They ran down that vast hall, past strange still glimpses of other worlds—and all of them, Claypool thought bleakly, the humanoids must have conquered. The outside door checked them again. They waited for Lucky Ford to open it, and came out into the brightening dawn.

Before them, beyond a covered walk, lay the sunken garden. Tall, red-scaled stalks swayed with a slow, unpleasant motion. A few of the pink, enormous buds had opened, and the unfolded blooms were clumsily taking wing.

For those things in the garden, spawn of a different evolution, were neither plant nor quite animate. The monstrous blooms flew free, like great awkward iridescent moths. On slow fragile wings of violet and dusty gold and black, they drifted and fought and thinly screamed and mated in the air.

Claypool felt the child shudder back from the strangeness of them. A breath of heated air brought him their odor—a rank and fetid stench that belonged to some jungle planet, and yet somehow reminded him of

the musky perfume Ruth used, Sweet Delirium. There must have been pollen, too, or some irritating dust from those slow, clumsy wings, for he was halted on the walk by a sudden fit of sneezing.

"I don't like those awful flowers," Dawn piped firmly. "Why do you think the black things plant them?"

Breathless with sneezing, Claypool didn't try to answer. But he didn't like them either. Something shook him, with an icy chill. And he thought of Ruth, sitting like an overgrown infant on the toy room floor, drenched with perfume and absorbed with her tower of soft plastic blocks. People were different, when they had taken euphoride.

His breath came back, and they ran on.

Searching that garden of half-plants, and the walks and lawns beyond, he could see nothing moving—nothing except those monstrous blooms, fruit of an alien tree of life, that hovered above in bright twos, kissing in a mist of golden pollen, or squeaking in strange fury as they slashed fragile clumsy wings with slow clumsy talons, and fell broken on the grass.

Beyond the garden, he saw the old search building—not yet demolished. He pointed, and tightened his hand on the child's. They ran toward it desperately.

The digging machine was somewhere out of his view, but the low gray building was perched, now, on the very lip of the new excavation. The west wall had already been ripped away, and dark cracks fissured the flat concrete dome. Half the roof was sloping drunkenly—but still it hadn't fallen.

He sneezed again as they ran, and wiped his eyes with the loose blue sleeve, and watched the grounds ahead. All the straight new walks and the flat new lawns seemed oddly abandoned. He saw a power mower, stopped and deserted. All the mechanicals, he thought, must be hiding from the child.

"Stop!" she sobbed abruptly. "That ship on the red floor—Mr. Overstreet says the black things are going to take it up and drop it on us!"

He let go her hand, and they turned back together. Claypool could see the cruiser on the landing stage, mirroring the blue dawn like a huge silver egg. He saw two black machines dart suddenly out of the blue-and-amber villa, racing for it.

Dawn Hall looked at them, and they fell.

She clutched Claypool's hand, and they ran again. They came to the end of the smooth new walk, and jumped an open ditch. Not for many years had Claypool moved so violently. His thin muscles jerked convulsively. Something hurt in his chest. He labored for his breath. Sharp stones cut his naked feet.

"But we'll make it," he panted. "We've got to make it!"

Then Dawn's fingers tightened in his hand, and she made a breathless whimper. Somewhere ahead, he heard a clash and whine of misused gears. And the child hung back,

pale with terror, staring up at a long new ridge of raw earth and broken rock.

"The thing that digs!" she whispered. "Coming!"

They sprinted, too late. That enormous slow machine, which Claypool had seen slicing the end of the mountain into geometric neatness, came lurching out of the new excavation, over a new embankment. The first sunlight flashed cold on huge bright blades and black-and-crimson armor.

It roared down to meet them.

XVI.

That mountain-eating saurian wasn't creeping, now. Its overburdened gears made a deep, reptillian bellow. The spinning tracks clanked and clattered on the steep rocky slope. The wide cutting blades slashed down wickedly, and cruel teeth glittered in its metal maw.

"Oh, Mr. White—Mr. Lucky!" the child was sobbing. "I can't find the black thing that runs it. I don't know how to stop it!"

And the machine came on.

She stumbled, as they ran. Claypool took her up in his arms, whimpering faintly, and tried to sprint. But that lurching armored monster swerved to cut him off from the old building. He tried to double back, and the thundering bulk of it veered again.

He feinted right, and darted left. For a moment, those vast whipping tracks failed to hold in the loose rubble of the new embankment. Wallowing clumsily in thick yellow dust, the machine almost buried itself. Claypool stumbled around it, along the rim of the mountain. He had almost passed, when a round stone rolled.

He went to his knees, and the machine climbed out of its pit. It wheeled and came after him, a grinding metal avalanche. He fled, with the sobbing urchin in his arms. Again he tried to pass, and the machine cut him off.

It herded him like a driven animal against the steep embankment. He tried to climb the slope and slid back again, floundering in broken rock. Dust choked him, and he toiled to breathe. Sharp stone blades slashed his naked feet. The shuddering child had become a hopeless burden in his arms.

"Please—Mr. White," she kept sobbing, "I can't stop it!"

He stumbled, and rose again. Dust caked the lacerations on his knees and feet with stiff red mud. His hot body quivered to a chill of exhaustion. But the pursuing machine was thundering close behind, and he staggered on again, blinded with stinging rivulets of dusty sweat.

"Stop!" the child shrieked suddenly. "Mr. Overstreet says stop!"

He blinked hard to see, and terror halted him. For that lumbering machine had driven him into a corner, between the high embankment and the lip of the precipice. A dozen yards ahead was the broken edge, from which the dark basaltic columns fell.

He tried to turn, and yielding soil caught his feet. He came down, full length. Twisting, he managed to keep the weight of his body off the child. But his breath was crushed out against a great dark boulder, and savage pain numbed him.

He couldn't get up.

Gears moaned and howled. Crimson-and-black, the armored machine wallowed out of heavy yellow dust, thundering down. Bright enormous blades were lifted ready, and red sparks flashed from the grinding jaws. He tried to help the child get out of the way, but she relaxed in his arms.

"Oh, thank you!" she breathed. "Thank you, Mr. Lucky!"

And that metal saurian veered again. The great crushing tracks of it passed close, covering them with strangling dust. The roar of gears was deafening—and abruptly stilled. Presently the mountain trembled faintly, and Claypool heard a distance-muffled crash from the talus slope below the cliffs.

The little girl stood up, brushing tidily at the dust on her worn yellow dress.

"I just couldn't stop it." Her voice still was small and dry with terror. "'Cause there wasn't any black thing in it, and it just ran itself. But Mr. Overstreet could see it, and Mr. White told Mr. Lucky what to do."

Claypool came stiffly to his feet. His twisted ankle throbbed, and his breath was a painful rasping. Dawn saw the muddy red gashes on his

knees and his naked feet, and her eyes went wide with a dark anxiety.

"Does it hurt—too much?"

"Not too much," he gasped. "We can stop them, yet!"

She caught his trembling arm and tried to help him rise. At a weary, plodding run, they came back from the brink of the cliffs, to the door of the old military building. Dawn stopped there.

"Mr. White says I must wait here," she said solemnly. "He says I must try to keep the black things away."

"Five minutes!" Claypool told her. "That will be enough."

He stumbled into dusty gloom, at a panting run. Ahead, he could hear an ominous cracking of tortured beams. The building was settling into the new excavation. At any instant, he thought, the weakened walls might collapse. But he didn't need much time now, to smash Wing IV.

A shudder ran through the groaning structure, and a hail of falling plaster halted him. Glancing back down the dark corridor, he saw Dawn Hall standing in the bright rectangle of the doorway, small and straight, brave with the ribbon in her hair. She waved him urgently on. He caught his breath and flung up his arm to shield his head and plunged into the rain of dust and debris.

Guided by touch through the blinding dust, he came to his old office. Grateful for doors that a man could open, he burst into the cloakroom beyond. The dummy fuse box was still closed, the rug still in place. Several pairs of dusty overalls and an old sweater still hung innocently on the hooks.

The floor shook to a muffled rumble, and he knew that another section of the walls must have caved into the excavation. But the ceiling held, and he could see no sign that the humanoids had found the hidden elevator. Frantically he uncovered the disguised controls, and punched the DOWN button.

Nothing happened.

He tried the lights, and found there was no power. He was trembling, now, to a new impact of alarm. He couldn't understand the power failure. The humanoids, he knew, had scrapped the old power systems, because they ran everything on beamed rhodomagnetic energy. But Project Thunderbolt hadn't depended on outside power.

He had equipped the secret installation with its own separate plant. The lower level of the vault, beneath the shop and the launching station, was packed with heavy banks of batteries, fed by twin motor generators and supplying the entire project through rotary converters.

He tried to put down his sick dismay. Dodge or one of the other technicians must have shut down the automatic plant before they left, he told himself hopefully, for fear the mechanicals might detect the vibration or exhaust gases from the motors. But the missiles would still be set and ready, he promised himself grimly, if he could reach the launching key.

Desperately he jiggled the button again. Still there was no response.

He dropped to his throbbing knees, threw back the rug, and tugged at a ring to lift the escape door. Blackness lay deep and quiet below. A breath of musty damp came up about him, and a reek of fuel oil, for the ventilators had stopped.

The building shivered again.

Trembling and toiling for his breath and uncertain of his strength, he dropped awkwardly through the floor. His bare feet groped painfully for the escape ladder, and found the rungs at last. He scrambled down frantically, into black silence.

That reek of spilled oil choked him. He clung desperately to the ladder while his stomach heaved convulsively, and then dropped down again. The sharp-edged rungs hurt his lacerated feet. They were slippery with grease from the cables, and once he slipped.

He hung on by his aching arms, and found the cruel rungs again. He imagined the hordes of black machines gathering about the frightened child on guard above. He caught his breath, and terror spurred him on.

His feet splashed into cold, greasy water, and he knew he had come to the bottom of the shaft. He stumbled in the dark, groping for the exit to the shop. Something in the water bruised his bare toes, and he sobbed with pain. But at last he found the door, and pushed it open.

The concrete threshold was level with his chest. He scrambled over it laboriously, and came panting to his feet in the narrow tunnel which led into the vault. The dark was absolute. He found a switch by touch, and snapped it hopefully. No light came.

But he knew the vault from the months and years that stern duty had imprisoned him here, and he padded confidently down the tunnel. His mind could see the shop, the benchs and tools and racks, and the launching station beyond. He knew where to reach for the key.

But his foot came down into emptiness.

Claypool toppled into vacant space, where the steel floor of the shop had been, and fell ten feet into ice-cold water. His right leg doubled and snapped. Agony flickered in his brain, and then a dull, increasing pain seized his knee and thigh. He tried to get up, and fell on his face in the oily water. He knew that his leg was broken.

Worrying jaws of pain tortured his useless leg, and slow waves of dark agony surged against his consciousness. But keener still were the pangs of failure. He coughed and strangled in the foul water, until he could breathe again, and then began crawling laboriously about the pit, on his hands and one sore knee, dragging his leg and looking for the firing key.

His groping fingers found only bare concrete, and the sheared bolts which had held generators and converters to their foundations. Project Thunderbolt had been efficiently dismantled, and the missiles were gone.

He couldn't understand it. He had seen no hint that the disguised

elevator had been discovered, and there was no other entrance. With the power off, that elevator certainly had not been used to remove the equipment, but where had it gone? His dull brain wrestled vainly with the problem, and gave it up.

The crawling search had hurt his leg, and he was faint and shuddering. He retched feebly and then lay still. He left his leg in the shallow water, vaguely grateful for its numbing cold. The throbbing agony gradually became remote and bearable.

Yet his failure rankled. He should have had Overstreet look for the missiles, but he wasn't quite used to this paraphysical stuff. Old dog and new tricks. A merciful drowsiness crept up from the chilling water.

Tclink!

That crash was like shattering glass. He started fearfully, and woke a new dull ache in his leg. Then he knew that it was only a falling waterdrop, and he lay listening sleepily for the next.

He was done. Project Thunderbolt was lost. He had failed Dawn Hall, and all the hopes of man. He tried to ease his throbbing knee, and lay shivering in the cold water, waiting for the next crystal crash. There was nothing else to do.

But a shaft of light struck suddenly into the pit, from the tunnel. It hurt his eyes. The water splashed, less loudly now. Blinking painfully, he watched slim machines jumping down into the pit. The gleams of blue and bronze were beautiful on their smooth black bodies, and their legs didn't break.

They glided toward him, blindly benign.

"At your service, Dr. Claypool." That silver tone was emotionless and kind. "Are you injured, sir?"

But his broken leg didn't matter now. For Project Thunderbolt was lost, and the hopes of man were dead. He nodded feebly toward the black emptiness on the concrete shelf above him, where the launching station had been.

"So you found it, eh?"

"We found you, sir," whined the small machine. "We observed you entering the old building, and we came to serve you as quickly as possible. The collapse of the structure delayed us, and we had to clear the rubble before we could reach you."

He tried to lift his head, staring in a sick astonishment.

"You must not attempt to move, sir. You might increase your injuries."

He felt too ill to laugh at the irony of that.

"How did you find it?" There was no reason for secrecy left, and he nodded at the empty foundations. "This installation?"

"We discovered the elevator shaft when we removed the debris of the old building, sir." Serene steel eyes stared out of the dark. "Can you speak without pain, sir?" He nodded feebly. "Then will you tell us what equipment was once installed here?"

The enormity of that question stunned him.

For it convinced him that the

humanoids knew nothing, even yet, of Project Thunderbolt. Then who had sabotaged the installation? Ironsmith? He shivered from something colder than the black water, and his stomach feebly heaved again to the oily fumes. But even Ironsmith, sanity assured him, could hardly have carried away a hundred tons of heavy equipment on that rusty bicycle.

"What was this installation, sir?" persisted the gentle-voiced machine. "And why was it removed?"

An impulse of lingering defiance spurred him to feeble invention. "This was our first neutrino lab," he mumbled desperately. "We calibrated our first search tubes from the coefficient of decay in the rock above. Later, when the military guard was set up, we removed the equipment into the building above, because of the water seepage. We left the pit for an emergency shelter."

The dark, intent machine seemed satisfied with that, but his own weary brain couldn't let the riddle go. He dismissed a fleeting notion that the equipment had been removed by some paraphysical agency. Even Dawn Hall, he imagined, would find it difficult to teleport sixty tons of storage batteries.

But somebody had those long, dreadful missiles now, and the launching equipment, and all the specifications he had left in that sealed safe. Somebody had stolen the power to detonate any planet, as easily as one savage can brain another with a wooden club.

Claypool retched weakly again, and suddenly he felt a kind of pity for the unknown thief. He was almost glad that those missiles were gone. Whatever happened now, he wouldn't have to bear the burden of them any longer.

"—questions, sir." That melodious whine seemed to come from far away. "It is necessary for us to find the child who came here with you. What is her name, sir? And where is she now?"

Claypool smiled. For now he knew that little Dawn Hall must have escaped from the collapsing building—perhaps to that dark place underground, with the sound of running water, where White and his other disciples were waiting. Tight-lipped, he muttered:

"I don't know."

"She is very dangerous," the machine droned sweetly. "She is unhappy under the Prime Directive, and she possesses supermechanical capacities. We are planning a new method to control such cases, and we may soon be able to serve such individuals. At present, however, they are still dangerous, because even euphoride fails in some cases to suppress supermechanical abilities. Where did she go, Dr, Claypool?"

"I don't know." And a bitter wrath seized him. Feebly, he shook his bruised fist at the dark face above him. There was no further need for caution, now.

"And I hope you never find her!" he whispered savagely. "I hope she goes on to Wing IV, and wrecks that cunning inhuman brain. I hope

she stops every humanoid, and frees every man that you're smothering with your lying Prime Directive!"

The cold, oily water splashed again, and dark identical faces came up around the first. It was hard for him to see them plainly, but they were all high-cheeked and handsome, faintly astonished and serenely kind.

"Now I've told you!" he rasped faintly. "Go ahead—kill me!"

"Sir, you do not understand our service," that gentle voice droned quickly. "It is true that you have demonstrated your own unhappiness, and now you must receive euphoride shots as fast as you can tolerate them. But our function is not to punish, but to serve. You have displayed no supermechanical powers, and you need not fear destruction."

He lay silent, not even shivering any more. The feeble gust of his anger had passed, and the cold had numbed his pain, and now he just felt very tired. Project Thunderbolt was gone, and he didn't have to worry any more.

XVII.

Water splashed again, and quick dark forms knelt around him. They touched him lightly, with warm deft hands. They slipped something under him. They moved his numb leg, very gently.

"You have been most unwise, sir," whined a small machine. "You have fractured your right femur and patella, and also damaged the ligaments of your right knee. You have showed your urgent need of our care."

"You weren't so careful," he muttered bleakly, "when you were chasing us with that excavating machine."

"That child was with you then," the bright voice sang. "It is necessary for us to use every possible means to restrain such dangerous individuals. For the greatest good of the greatest number, we must preserve the Prime Directive."

They lifted him, then, on the stretcher. They carried him, swaying gently, back to the repaired elevator. For all their skill, however, a thin new pain throbbed in his swollen leg. Cold sweat broke over him, and his awareness dimmed.

He knew they were carrying him back to the villa on the mountain crown. Once a hot, musky reek filled his nostrils and made his stomach flutter. At first he thought it was Ruth's perfume, and then he knew they were passing that sunken garden, where those queer, clumsy blooms flitted and kissed and squeaked and died.

He opened his eyes again, in a small white room. He lay on a cold table. Quick deft machines were stripping off the damp rags of his torn robe, and sponging away the blood and grime. A new sharp odor took his breath, and something burned his lacerated feet. He tensed, when something touched his throbbing knee, and stifled an outcry.

"Your alarm is needless, sir,"

purred a mellow voice, "because your pain will soon be gone."

Soft plastic fingers lifted up his arm. He felt a cold swab, and saw the glitter of a hypodermic needle. His dry lips moved to protest, but no sound came. A circle of black faces swam above him, sleekly gleaming and all alike. The machine with the needle murmured softly:

"Here is your first shot of euphoride. It will help relax you, while we set your broken bones. All your worries are ended, sir. You will be quite happy, now."

He felt too weak to struggle, and he scarcely felt the needle. He lay still, in a vague submerged awareness. The throbbing of his leg receded into remote unimportance. Deft hands drew a mask over his face, and he inhaled a cool fragrance.

Time began to skip.

He was back in that vast bedroom, with the luminous murals of village boys and girls dancing in a simpler time. He wondered dimly if people had really been happier then, before machines became supreme.

The vast crystal window was once a screen of fine-veined jade against the desert day. It was clear as a crimson sunset. Again it was glowing dimly golden, and he knew the time was night.

Gentle hands turned him on the bed. Needles stung his arms again, but they merely pushed him deeper into drowsiness. He was vaguely aware of sleek black faces, of bright steel eyes forever watching, blind and ruthlessly benign.

Once he saw his wife.

A mechanical guided her to his bedside. She carried a furry toy, dangling by one bright wing, shaped like one of those bright moth-blooms from the sunken garden. Below the thin, sophisticated arch of her plucked brows, her dark eyes were wide and childish and dimly troubled. He caught her perfume, first a pleasant breath, and then a choking wave of sweetness.

"This is Ruth," the machine droned sweetly. "She is your wife."

She bent over him. The trouble in her eyes changed to a vague recognition. Her full woman's lips made an uncertain, wistful baby-smile. She reached out and softly touched his forehead and his lips. He thought he saw a shadow on her too-young face, a momentary cloud of baffled longing.

Then she found that she had dropped the furry toy. Her lips turned petulant, and quick tears rolled down her cheeks. The quick little machine picked up the toy, and she reached for it jealously. She hugged it in her arms, and let the mechanical wipe off her tears. She smiled again, crooning to the toy, and the humanoid guided her away.

Another blind machine stayed beside his bed. Claypool stared at it, taut with a helpless hate. But then another dark oval face bent over him, intent and kind. Another needle stabbed his arm, and he forgot—

He was lying in a padded chair, which had a lifted rest for his bandaged leg. A steel-eyed creature

murmured softly to him, and pushed his chair across the room to a vast clear window. Beyond the window was a sunken garden.

Tall red stalks, in the garden, waved slowly in an unceasing, interesting motion. Pink sacs, on their crowns, writhed with a promise of interesting contents. One sac, he saw, was bursting.

He watched, absorbed.

A dark, wet thing crept out of the broken sac, crawling down the stalk. It dried in the sun, turning slowly bright. Huge wings unrolled, violet and yellow-dusted. They stiffened and spread, and finally the thing floated away from the stalk.

He followed it, fascinated.

Soaring over the garden, it met another. They wheeled, in a splendid dance. They brushed vivid wings. They kissed delicately. They hovered together, in a cloud of golden dust. Then one slashed treacherously at the other, with a dark fragile talon.

The other struck furiously back. Bright wings were shattered as they battled, golden bodies torn. At last they fell, locked in a fatal embrace. Breathless, he watched them until they dropped out of sight. And then he forgot—

A wide tray was fixed before him on the chair. Scattered on the tray were bright fascinating shapes, warm and soft to his uncertain hands. Some of them he could fit together, to make different, interesting shapes. But his hands were clumsy. Sometimes the soft shapes fell silently, out of his reach and out of his memory—

Time went by, and he forgot.

He lay on a hard table in a small, white-walled room. Many silent dark things were about him, watching with bright steel eyes which never blinked. They stabbed more needles into his arms, and clear liquid flowed through transparent tubes. He felt suddenly cold and bad, but the dark things spread a warm cover over him.

Then the needles were gone, and he felt warm again. The little machines lifted him back on his special chair, and wheeled him back toward his room. He found something clutched in his hand. It was a gay-colored furry toy, shaped like a winged worm. It had an odor of rank sweetness, which sickened him.

He tossed it away, disgustedly.

A silent machine pushed the chair back into his own big room, where young men and women danced on the walls in never-fading joy. It left him there, alone. He felt his leg. The bandages were gone. He flexed the muscle, and felt no pain. He was about to test it on the floor, when a cheery voice spoke behind him:

"Well again, Claypool?"

He started, and saw Frank Ironsmith. The younger man came strolling idly in, smiling amiably and, unattended by any humanoid. The big door slid shut behind him. He came up to the chair, with his reeking black briar in his left hand, genially extending his right.

Flint-faced, Claypool ignored his hand.

"Say, Claypool—don't you remember now?"

Claypool nodded stiffly, not bothering to conceal his hostility. Motionless in the chair, he studied Ironsmith with narrowed eyes. The other stepped back a little, calmly unruffled, absently testing the hot pipe with his fingertips to see when it would do to put it in his pocket.

He seemed less sophmoric and more mature, Claypool thought. Still candid-seeming, his smooth, sunburned face looked firmer and more forceful. Still clear and honest, his gray, level eyes were somehow sobered.

Even his clothing was different. The dilapidated slacks were gone. He looked comfortable in a loose-fitting suit of some gray, tweedy stuff. It made him seem larger and more important. The coat fastened conservatively, Claypool noticed, with old-fashioned buttons that a man could undo.

"I had them neutralize your euphoride," he murmured casually, "because I want some help. Is your memory clear?"

Claypool nodded, bleakly.

"I want you to help me locate that fanatic, White, and his gallery of freaks. Because we still can't find them, after all these months."

Claypool said nothing.

"That child was with you nearly an hour, I believe." Ironsmith tested the pipe again, watching Claypool with shrewd gray eyes. "She probably told you where they're hiding, and exactly what they're up to. Even if she didn't, there would be clues enough to work on."

A dark place underground, Claypool remembered, and the sound of running water. His thin lips tightened.

"It's only folly, to help conceal them." Ironsmith's voice was dispassionately persuasive. "Because White's a blundering fool, and he can do a lot of harm."

He tried the pipe, and put it in his side pocket.

"The cause at issue is something more important than you might imagine. I'm not at liberty to tell you much about it, so long as you're against us. But I had your memory restored, to make you an offer."

Claypool nodded, waiting.

"Perhaps you've guessed that I'm not acting alone. I can't tell you much about our group, but I'm asking you to join us, Claypool—if you're willing to help us trap White and his fellow fanatics."

Claypool leaned wearily back in the chair.

"The advantages to you are considerable," Ironsmith urged him. "We can arrange for you to keep your memory—and your mind is really too fine, Claypool, to be wasted under euphoride. You can even free yourself from this close supervision by the humanoids, if you'll join us.

"Now what about it?"

Claypool sat up again, bleakly alert. His mind could see little Dawn Hall, brave with that red ribbon in her hair. He felt a warm surge of loyalty to her and her

strange companions. But he didn't want to go back to oblivion.

"Who's with you?"

Ironsmith merely shook his head.

"At least I must know one thing." Claypool stared at the open-faced, fresh-shaven man, and shivered inwardly. "Did you—or this mysterious group of yours—remove any military equipment from the vicinity of the old military installation here?"

"That doesn't matter—what's your answer?"

Claypool straightened.

"Send back your machines!" Claypool gulped, and tried to lower his voice. "I don't know what kind of man you are, Ironsmith—or even if you are a man!" He felt a tingle, at the back of his neck. "But I'm not turning against my kind."

Solemnly, almost sadly, Ironsmith pursed his lips.

"I'd hoped for something a little more sane," he murmured softly. "I had hoped you had learned enough to accept the humanoids, and face reality. Because we're offering you a splendid opportunity, Claypool. Why not open your hand, and take it?"

Claypool merely blinked.

"I'm sorry." His low voice was calmly unresentful. "We do need your help. I'm sorry to see you wasted, when you might do so much. But we've other ways of getting at White."

His tweedy shoulders tossed carelessly.

"For the man's more fool than philosopher, and his own folly will give him up. Before his criminal blundering has done any desperate harm, I hope! But I don't like to abandon you."

His voice dropped, hopefully.

"We can open a new life to you, Claypool. We can show you a width and breadth and depth of living you never dreamed of, and a splendor of life you never imagined. Won't you trust me, and come along?"

Claypool shuddered in the chair, gulping painfully.

"Trust you?" He laughed sardonically. "Get out!"

Ironsmith shrugged regretfully, and turned to the door. It slid open. He glanced back, with an odd little grin of baffled sympathy, and then stepped quickly out. Three black machines came in. One of them carried a hypodermic needle.

"At your service, Dr. Claypool," it purred sweetly. "Do not be alarmed. We are acting under the Prime Directive, to make you happy again. This injection will cause you no pain."

Two of them caught his arms. Watching the bright needle, he tried to flinch away from it. The black hands tightened on him, soft and gentle and invincible. He watched the flashing, efficient stab of the needle.

It didn't reach his arm.

XVIII.

In that first staggered moment, Claypool thought that his own frantic effort had somehow broken the unbreakable grasp of the machines. He thought he had fallen, somehow, out of the padded chair. He sprawled on cold, hard-packed sand, and sat up dazedly.

"Oh, Dr. Claypool!" Unbelievingly, he recognized the clear, thin voice of little Dawn Hall. "Did we hurt you?"

His bewildered eyes found the child, and then White and Lucky Ford, Graystone and Overstreet. They stood spaced around him in a wide circle, all watching him, all strangely taut. Their strained faces slowly relaxed.

Little Ford mopped his dark, seamed face with a handkerchief. Graystone the Great dipped his red nose in an awkward, formal bow of welcome. Overstreet nodded vaguely, blinking dim eyes. Majestic still in that worn silver cloak, in flowing, fiery mane and beard, White came striding to help him rise.

"So we got you, after all!" the huge man drawled softly. "Welcome to our refuge!"

Grasping White's great hand, Claypool came up awkwardly. Carefully, he tried his leg. The knee felt weak, but it bore his weight without pain. The damp sand felt cold under his thin slippers. He peered around him, blinking dazedly.

The uneven walls about him were water-carved limestone. Overhead was a rough natural dome, incrusted with stalactites and all aglitter with white calcite crystals. The air seemed damp and cold. Somewhere he heard a thin whisper of water running.

"Where—?" he whispered shakenly. "Where is this?"

"Perhaps we're safer if you don't know the precise astrographical coordinates," White told him. "But we're some hundreds of feet underground. A fortunate spot. There is running water, and air enough for ventilation, but no passage big enough for anything else."

"Then you . . . I—" Claypool shivered, speechless.

White nodded his immense, shaggy head.

"Your own unconscious mental resistance caused us to fail, the first time we tried to bring you here. That's why we didn't warn you, this time. We just waited for a likely moment, when you wanted to get away from Starmont."

"I certainly did!" Claypool shuddered again, and feebly grinned. "One more second—"

Tremulous with a voiceless gratitude, Claypool stumbled around that circle, shaking hands with the men and the child who had snatched him away from oblivion. He saw a change in them.

Before, when he met them at Dragonrock, they had been new recruits of White's, just rescued from madhouse, gutter, and jail. Now they were shaved and clean and better fed. Old Graystone was not quite so gaunt, Ford not quite so nervously cynical, Overstreet not so pale.

"We've been watching Ironsmith." White's great hand fell on his shoulder, heartily. "I'm glad you didn't sell out to him and his evil machines—because we never will." His blue eyes had a glint of savage purpose. "Come along, Claypool. Let me show you what we've done, and tell you why we need you now."

Claypool swayed again, as he stepped on his right leg, and White put out a mighty arm to steady him.

"Did you know that Ironsmith almost caught us at Dragonrock, after he went over to the mechanicals?" the big man rumbled bitterly. "We weren't expecting any treachery, then. I trusted him, and I was even hoping he would join us."

Claypool limped anxiously after him, to see the sanctuary. The flat sandy floor was scarcely fifty feet across. Low-roofed recesses, under the edges of the glistening dome, were rudely curtained off for living quarters. Little Dawn Hall proudly displayed a tiny room of her own. One jeweled alcove made a kitchen. A thrumming generator, in another, gave current for the lights strung across the shining roof. Claypool kept peering at the equipment, still bewildered.

"You brought all this, by teleportation?"

"There's no other way," White assured him, "but we're improving. Our chief worry, now, is the danger of leaving clues for Ironsmith and his gang."

The hard clay floor, in another low chamber, had been leveled to support a long workbench. The charred and acid-bitten wood was piled with crucibles, small tools, and silver-colored metal ingots.

"Here's where we need you, Claypool." Dramatic in the silver cloak, White gestured with his great emphatic arm. "To help us build the new relays, and change the Prime Directive."

Claypool looked up from the furnaces and lathes and drills, back to that imperative giant. The cold fire blazing in his eyes might be fanaticism, Claypool thought, but he seemed much too sure for a blunderer, too keenly alert for any fool.

"Just the interpretation," the big man added. "I've no quarrel with the actual words—*To Serve and Obey, and Guard Men from Harm.* But the humanoids apply them a little too efficiently!"

Thoughtfully, he weighed a heavy ingot on his palm.

"Ironsmith would call me a criminal anarchist, I imagine, and he'd sneer. But the worth and the dig-

nity and the rights of every individual are the basis of my philosophy—and the cause I'm fighting for."

His voice throbbed with a restrained intensity of feeling.

"You've heard the old bull that a benevolent despotism is the best possible government. That was what Sledge believed when he made the humanoids—but he made them benevolent enough and despotic enough to show the unsoundness of that."

He put the ingot down, with a crashing force.

"I'm an equalitarian," he boomed. "I believe in equal rights for all. I want to modify the Prime Directive, to assure every man and woman the same freedom that only Ironsmith and a few other double-dealers now enjoy. Even the freedom to do wrong! And here's the change I want to build into that relay grid that runs the humanoids."

He paused to fumble impatiently in a clutter of drawings and notes stacked under a white metal block, and then read scrawled words from the back of an old envelope.

"Here's my statute of limitations, to amend the Prime Directive: 'We the humanoids cannot destroy human freedom, for that is more precious than the life of man. We cannot move even to aid any man, unless commanded by that man or another. And we cannot restrain any man, except when that restraint may be necessary to prevent direct injury to another. For men must be free!'"

Claypool gulped a long, eager breath.

"I'm with you," he whispered. "What is to be done?"

White replaced the tattered envelope under the ingot. He caught Claypool's hand in a grasp that snapped his knuckles, yet his massive face was grave.

"The undertaking is surrounded with every sort of dangerous vicissitude," he rumbled solemnly. "A nearly impossible task, which must be attempted with inadequate means, in defiance of such ruthless enemies as Ironsmith, in the face of hazards that even Overstreet can't quite foresee. Until you were here, I saw no hope at all."

Claypool peered at the bench, and swallowed uneasily.

"Just what do you expect of me?"

"First, I must explain what we've done. I believe I told you that I once fought with old Sledge, against the humanoids. If we had stayed together, I think we could have won. Because the job is going to take a combination of physical and paraphysical means.

"The changing of those relays, you see, is a physical engineering job. But the grid was built so that it must protect itself from change. It does that, effectively. No man can approach within three light-years of Wing IV—not by any physical means.

"But Dawn has been there."

Startled, Claypool looked around for the child. She had followed them about the cave at first, and

now he expected to see her playing somewhere on the sand. He couldn't find her.

"She's gone, right now," White rumbled softly, "after palladium. Overstreet has discovered an alluvial deposit of it, you see, on a planet where men and the humanoids have never been. The nuggets are nearly pure, bearing only traces of rhodium and ruthenium. Dawn gathers them, and we smelt them here."

"That little child?" Claypool whispered blankly. "Gone to another world, alone?"

"A necessary risk. We've got to have the metal. We reduce the danger as far as we can. Overstreet is watching her. The chief hazard is from Ironsmith and his peculiar allies."

Claypool nodded uneasily, asking:

"What are you doing with the metal?"

"That's you're province. Because it's going to take a top-drawer rhodomagnetic engineer to rebuild those relays. Old Sledge could have done it, if we hadn't fallen out. You'll have to take his place."

The damp heavy air of the cave seemed very cold.

"You don't mean—?" Claypool stared at the red-bearded giant. "You can't mean—?"

But White nodded deliberately.

"That's it, Claypool. We're going to send you to Wing IV. We'll give you all the help we can. But the real job is yours, to rebuild the grid that controls the humanoids."

XIX.

Claypool felt a sudden need for support. He clutched the rough edge of the workbench with cold awkward hands, and then he sat down on a wooden stool, to take the weight off his trembling knee.

"To Wing IV?" He stared at White, in sick protest. "You know I can't do teleportation."

He was haunted with the memory of his failure, when Dawn Hall had first tried to bring him here from Starmont. He didn't understand the cause—unconscious resistance or anything else. He only knew that instantaneous translation was—physically—impossible. And still he hadn't grasped the new science of paraphysics.

"You'll learn," White was drawling. "You'll have to learn enough to help us take you there."

But Claypool shook his head. A sweat had burst out on him, and he shook to a sudden claustrophobia. The damp air seemed too heavy and too still. He could see the crawling dark, waiting cold and eternal in every narrow fissure of the cave, and he heard the whispered mockery of water running through crevices too small for anything else.

He felt all the weight of the rock above, and a pressure squeezed his chest. His stomach contracted, hard in him. The thumping of his heart became sharply painful, too fast and too loud. He moved his knee too quickly, and ignored the throb of pain.

For there was no way out.

No way in space, except for the

narrow fissures and the deep gravel beds, where cold black waters ran. Every crevice and recess, all around that crystal dome, ended in clotted shadow and solid rock. The cavern was a grave, and he was buried here.

Claypool set his chattering teeth, and grimly fought that fever of fear. Struggling in a chasm of horror, he clutched a feeble thread of reason. Desperately, he burst the constriction around his chest, and caught a sobbing breath. The crawling shadows receded again, and he turned weakly to White.

"I'm sorry." He managed a feeble grin. "It just hit me—a sort of shut-in feeling"—he bit his lip again, and clung for a moment to the scarred workbench—"because I just can't do teleportation."

Towering magnificient beside him, White drawled quietly:

"You're a scientist, Claypool, and paraphysics is a science. That means that observed phenomena can be linked by hypothesis, illuminated by theory, and integrated by law. It means that effects are subject to analysis by logic, to prediction from experience, to control through cause.

"A difficult science, I admit." White shook his bright mane, regretfully. "Necessarily so, because the instrument of research is also the subject. The dissecting knife can't easily dissect itself. Many times I've failed, Claypool. For all my years of effort, I've gathered more questions than answers. What, for example, is mind?"

White's huge shoulders lifted heavily, and his intense blue eyes stared away, through a low archway of gleaming calcite, into an avenue of darkness. That was another blind passage, ending in living rock, but little Dawn Hall came running out of it.

She stood blinking for a moment, as if dazzled by the light, and then came on across the smooth hard sand. Claypool saw a sudden dust of white forming on the worn fur collar of her big leather coat, and on the ragged ribbon in her hair. Her blue knobby knees shook with cold.

Silently, she handed White a small leather bag. He poured out a little pile of nuggets on a balance pan, and Claypool recognized the platinumlike luster of palladium. In an instant the nuggets were covered with frost, and smoky trails of white condensation drifted down from the pan and flattened on the bench. The child wiggled her bare toes against the sand, and looked at White with huge, adoring eyes.

"Shall I go back?" she whispered.

"I think that's all we need." He glanced at the frosty mound on the pan, and smiled gently through his flaming beard. "You've done a good job, Dawn. Now Graystone has some hot broth waiting for you."

"Oh, thank you! I'm glad I needn't go back, 'cause it's awful cold out there."

She ran on, happily, toward the kitchen alcove. Staring at the dust of frost on her black hair and her

coat, Claypool felt a tingle of wonder.

"It is cold there," White was drawling gently. "Those rich gravels must have been washed down a long time ago, because that planet has no erosion now. It's lost from the star that must have warmed it once, and it has no air or liquid water. The temperature is near the absolute zero."

"Eh!" Claypool started, blinking at the bearded giant. "You mean . . . you mean that child can defy the laws of nature?"

"No." White shook his massive head. "She merely uses them—I think unconsciously. She just—adapts. She used to be always cold, you see, here in the cave. Lately, somehow, she has learned to keep warm—she can't tell you how."

White's drawl held an overtone of awe.

"I'd like to know how she does it. I suppose she has developed a psychophysical control over the molecular vibrations of heat, and the molecular flow of evaporation, so that she can stop the loss of heat and water and oxygen from her body. I believe she can even disassociate carbon dioxide, to oxygenate her blood. However she does it, she can live on that dead planet—long enough."

A cold something moved up Claypool's spine.

"Are you sure she's—human?" he breathed uneasily. "Not some mutation?"

"She's human!" White boomed vehemently. "I know that. For all my bungling failures, I know that psychophysical abilities are as old as life. I know they are born in the brain of every man, and they lie there within his unconscious grasp."

Exasperation shook his voice.

"I know that—and yet I've failed to reach the real secret of it. Perhaps there is some barrier that I can't see—perhaps something as obvious as this."

Impatiently, he picked up a white ingot, and slammed it down again. Claypool saw the undying hate sweep through his huge body again, like a bitter wind, and blaze like a sullen fire in his eyes. But hate alone, even in such magnificence, would never stop the humanoids. Calm-voiced now, Claypool began pointing out the difficulties.

"Suppose we do get to Wing IV. Even suppose we find that mechanical brain. Rhodomagnetic relay grids aren't exactly simple, you know—not even the little gadgets I built to pilot the missiles of Project Thunderbolt."

"I know," White drawled. "I've been studying that brain ever since I first met old Sledge. I've had Overstreet watching the way it works, and Graystone observing how it thinks. And Dawn has been there!"

Claypool glanced uneasily across the cavern. Under the white crystal arch of the kitchen alcove, the child sat on a bench before a rough table, waiting while old Graystone filled her steaming bowl. She saw him, and smiled solemnly.

"She has been in the shop where old Sledge built the first sections of the grid," White went on. "She

found it still intact, buried deep in the new relays of the brain. She even found Sledge's old safe there, still packed full of his notes and drawings and preliminary models. She brought back everything you ought to need."

White pointed to a stack of yellowed notebooks and a sheaf of faded blueprints, and pulled out plastic trays filled with tiny stampings and castings and machinings of silvery palladium. Claypool opened one of the books, and frowned at the dim hieroglyphics.

"It's not quite so bad as that," White assured him softly. "Perhaps old Sledge's notation seems a little strange, but science is a universal language. I can help you with the rudiments he managed to teach me."

He gestured at the workbench.

"All the tools in Sledge's shop are duplicated here—collected mostly from junk yards where the humanoids are piling up machines that are too dangerous for men to use."

A stern amusement lit his face briefly.

"We'll build the new grid sections here," he said. "Enough of them to contain our amendment to the Prime Directive. When they're done, you and Dawn must go to Wing IV. All you have to do there is cut out the old sections, and install our new ones."

Claypool caught his breath. He riffled through a stack of dusty drawings, and turned minute machinings with a careful fingernail.

"Didn't Sledge try to change the relays?" he whispered hoarsely. "And didn't the humanoids stop him?"

"But Sledge didn't know psychophysics." White protested softly. "And the humanoids don't—not yet. They failed to discover Dawn, while she was going through the old shop. I think you'll have time to change the relays."

Claypool blinked at him, doubtfully.

"Because the humanoids are actually blind," the big man explained. "Anywhere else, their rhodomagnetic senses are far quicker and keener than human sight. But there about the grid, the intense rhodomagnetic fields of it interfere with the weaker sensory fields of the individual units."

Claypool screwed a jeweler's lens into his socket, and stirred a tray of microscopic screws with slender-nosed tweezers. But his fingers still were stiff and awkward, clammy with a sweat of apprehension.

"It's a brain operation, literally. Like the human brain, that grid has no sense organs. You can perform the operation without disturbing the patient—if we're ready in time."

But White's giant shoulders tightened under the silver cloak, in an attitude of troubled expectancy.

"I'm afraid our time is running out," he added, "because the humanoids are building something new, on Wing IV. What it is, we can only guess. But my own guess frightens me. Overstreet can see it, and he says it's as big as the brain machine.

"Underground levels are full of power plants, he says, and some kind

of transformers. Above the ground, they're building a big dome, of some new synthetic, to cover something else.

"The machines are packing that dome with billions on billions of relays, linked in another grid. But the relays aren't like those that run the humanoids. For one thing, they are made out of platinum and osmiridium alloys, instead of palladium."

Above the red splendor of his beard, White's cragged face was pale and stark.

"But we don't know what it is, and we can't find out. Because, when the construction of that new grid was well under way, something closed that dome to us. Overstreet can't see inside it any longer. Dawn tried to enter it, and failed."

White's sullen eyes seemed haunted.

"That barrier isn't physical," he rumbled solemnly. "So I'm afraid that the humanoids themselves have begun psychophysical research. And if they have, we must act without any great delay."

XX.

On the mother world, in the dim past, men had sought the philosopher's stone. That fabulous stuff was to turn base metals to gold, and human confusion to shining understanding. Discovered at last, it proved to be common iron.

Magical metal of the first atomic triad, iron created the new science of electromagnetics. It wrought all the marvels of electronics, and even freed atomic energy. Electromagnetics actually achieved the dream of the alchemists, and men manufactured elements.

Philosophers tried the new wonder stone on the common facts of the universe, and most of them responded. The electromagnetic spectrum ran from radio waves to cosmic rays, and mathematicians dreamed of a unified field equation.

A few facts, however, were stubborn. A few phenomena, as various as the binding force which contained the energy of atoms and the repulsion which separated galaxies, perversely refused to join the electromagnetic system. Iron alone was not enough.

But then men tried palladium.

Claypool and Sledge, working far apart in time and space, both had shaped that precious white metal from the second triad into another key, to open another science. The last tragic gift of iron had been the atomic bomb. Palladium gave men Project Thunderbolt, and the humanoids.

Claypool sometimes thought wistfully of that sublime and tortured hour, back at Starmont, when he thought that shining key had opened the ultimate goal of knowledge to him. All the laws of the universe, he thought at first, might be derived from his basic equation for the rhodomagnetic field.

He stumbled out of the observatory, in the blue chill of a windy winter dawn, to hammer and shout at the door of the computing section. He roused Ironsmith at last, and pushed his sheaf of hasty calcu-

lations at that sleepy-eyed youth.

"A rush job," he barked impatiently. "I want you to check all these, right away—particularly this derivation for *rho*." Then he noticed Ironsmith's blinking astonishment, and started to apologize for his urgency.

"That's all right, sir," Ironsmith assured him cheerfully. "I was running the machines until an hour ago, anyhow, playing around with a new tensor of my own. Things like this aren't work to me, sir."

Burning with impatience, Claypool watched him glance indolently through the pages of hurried symbols. His pink face frowned a little, and he shook his sandy head. He said nothing, but turned with an infuriating deliberation to his keyboards and began deftly punching his paper tapes, setting up the problem in a pattern of holes that the electronic machines could read.

Too restless to wait on the murmuring, unconcerned machines, Claypool went out again, to stalk the lawns of Starmont like a planet-bound god. Watching the dawn turn golden on the desert, he thought his groping mind had grasped a mightier power than abided in the rising sun. For an hour he was great.

Then Ironsmith came pedaling after him down a gravel walk, yawning sleepily and chewing gum, to shatter all the splendor of his vision.

"I found a little error, sir." Ironsmith was grinning with a modest amiability, unaware of the staggering blow his words inflicted. "I think you can see it, sir, right here. Your symbol *rho* is irrelevant, and it has no obtainable value. Everything else is correct."

Claypool tried not to show how much that hurt him. He thanked the lean youth on the bicyole, and stumbled dazedly back to his desk. Ironsmith had seen only a symbol that canceled out, but he had felt the ultimate treasure of the universe slipping through his clutching fingers.

His basic equation remained true enough. Rhodomagnetic energy, with its infinite velocity of propagation and its inverse variation with the first power of the distance, was still the mightiest force that man had ever found.

Yet the two, palladium and iron, still were not enough.

Hiding from the humanoids now, in that deep limestone cavern, Claypool heard the haunting whisper of dark water running through passages too small for a man. He shrank from the crushing pressure of those calcite-crusted walls, and shivered to the air's dead chill, and tried not to see the crawling blackness in every blind crevice.

He set out to study the laws and the mocking contradictions of White's half-science of psychophysics. He grasped at the amazing arts of old Graystone, and the telekinetic skills of little Lucky Ford. He sought the far vision of Overstreet's myopic eyes, and the ultimate fleetness of Dawn Hall's grimy little feet.

Watching the child flit out of

that closed cavern and back again, to bring some useful tool that Overstreet's far searching had discovered, Claypool accepted the fact of her ability, and he strove to shape a rational theory for it.

"All this used to seem impossible," he confessed to White. "But now I think I see how psychophysics can fit into the established laws of quantum mechanics. Teleportation, now—that could be a matter of exchange-force probability."

The huge man looked up from his work at the bench, blue eyes alert.

"Perhaps you know the theory? Anyhow, the exchange-force concept arises from the fact that electrons are identical. Mathematically, any movement of any electron can be treated merely as a change of identity with another. And the forces of such exchanges—like most subatomic phenomena—are governed by probability."

"But—about teleportation?"

Claypool stared past the other, at the closed, calcite-frosted walls of that deep crypt. Something cold touched his spine. He felt numbed with an icy wonder, that any act of the mind could open that living stone. But he had seen Dawn come and go, and now he thought he saw the way.

"Those forces are timeless—there's a place for them in rhodomagnetics," he said. "And they aren't limited to short distances—except by a factor of decreasing probability. Because each electron is only a reinforcement in a standing wave-pattern—which theoretically pervades the whole universe."

He gulped an eager breath.

"I think that's it! When Dawn visits that cold planet, I think there is no actual movement of matter, but only a shifting of patterns of identity." He nodded, pleased with that distinction. "I don't know the precise mechanism of atomic probability, but Dawn has already showed that she can operate it to detonate unstable atoms. Perhaps teleportation is just as easy!"

"No doubt." White grinned through his beard, and frowned again with thought. "But I used to think that physical time and physical space might be just illusions—"

"Quantum mechanics can be interpreted nearly that way, come to think of it," Claypool said. "I remember a theory that time and space are not independent entities, but rather only the incidental side properties of the energy units that appear variously as waves and particles—call them wavicles!"

He blinked at the huge man, hopeful and elated.

"There I think we have it—the mechanics of teleportation! Not a transfer of actual substance, but rather an exchange of identity patterns, made by controlled probability. That avoids the problems of inertia and instantaneous acceleration, that used to trouble me."

"Might be." White nodded, still frowning. "I guess you're right. But what is the actual mind-force? How does it act to control atomic probability, or exchange probability? What *is* probability? What are the

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equations of psychophysics? The laws? The limits?"

And Claypool shook his gnomish brown head, baffled again. That uncertain hypothesis, he saw, was only a flicker in the dark. The full truth lay somewhere ahead of him, still veiled in ultimate mystery. White always asked more questions than he could answer. Yet that feeble illumination had comforted him, and it cheered him on.

He toiled to decipher old Sledge's notes and drawings. When he came to study the layout of the grid, White had him take the tattered plans into Overstreet's little curtained grotto. The clairvoyant sprawled inert in a creaking wooden chair. Pale puffy hands were folded on his fat knees, and his vague eyes stared through the lacy fretwork of calcite on the walls.

"Yes, I can see the Central . . . the brain," he whispered. "They haven't blocked it off, like that thing in the dome. Not yet." He took the drawings clumsily, peering as if he could scarcely see them. "Here's Sledge's shop, where he built the first humanoid—it isn't changed, because he built them somehow to stay out of it."

His puffy finger pointed.

"And here, beyond the tower door, are the first sections of the brain—the ones Sledge built. The humanoids have built on millions more—and changed the whole planet so that he wouldn't know it—but those first sections are still the same."

Overstreet blinked dimly, behind thick lenses.

"I can still read the numbers that old Sledge painted to identify the sections. The first three—here and here and here—contain the Prime Directive. The next two—numbered four and five—govern the interpretation. They're the ones that must be changed."

Toiling at the bench, Claypool lost track of time. For that closed cave was sealed against the flow of day and night, and White had conquered sleep. Claypool failed to grasp the method of it, but he followed White's stern regimen and came to share a little of the huge man's driving vitality.

And he had no time to sleep.

His hands were blistered from handling hot metal, and numb with weariness. His eyes ached from straining through the lens, and his back was sore from bending. His weak knee throbbed and swelled. But still he worked on—and his fatigue began to fall away. His old dyspepsia ceased to trouble him, and he ate his hurried meals with relish. White assured him blandly that he was learning psychophysics.

The white blocks of rare palladium were fused and cast and machined, rolled and stamped and drawn. White took his place at the bench, and little Ford, and even the child. The new relays went together, and Claypool soldered them into new grid sections.

Time was suspended in that deep cave, but Wing IV kept moving. Sitting heavy and pale in his creaking chair, Overstreet peered away through the white-rimed walls, and

saw the shape of trouble. At last he came shuffling to the cluttered bench, and touched Claypool's arm.

"I can't see it clear." His hoarse whisper was muted with worry, and somehow apologetic. "I can't see it clear, and I don't know why. But things are happening, on Wing IV. I believe that new thing in the dome beside the brain is nearly done. I believe it's time for us to try."

Behind the heavy glasses, his puzzled eyes seemed vague and strange and dark.

"I think it's now, or not at all."

Claypool tested a last relay, and put down his tools and his jeweler's lens, and said that he was ready.

XXI.

The time was now, and Claypool had thought that he was ready. He had watched Dawn come and go, and elaborated his own exchange-force theory of teleportation. But Wing IV was two hundred light-years away.

Standing with the child and White, beside the palladium-shielded sections waiting on the bench, Claypool dwelt upon that staggering magnitude. That was twelve hundred trillion miles. That was farther than a naked human eye could see the atomic blaze of an ordinary star.

The vastness of that distance brought his old doubts back, and the calcite walls shut him in again. He felt the stuffy deadness of the air, and the merciless pressure of living stone, and listened to the mockery of dark water running where men couldn't go.

His stomach twisted, and his flesh turned clammy. All the orthodoxies of his old training came trooping back to haunt him, out of dusty laboratories and gloomy observatories. It couldn't be done, his old habits screamed. No man could simply step across twelve hundred trillion miles, as if it were a line drawn on the floor.

He turned uneasily away from the shining urgency of the new grid sections, those two long palladium boxes heavy with all the hopes of man. He mopped his cold forehead, and blinked unhappily at the tall impatient man.

"I can't do it," he confessed. "It's just too far." He gulped, and peered hopefully at the solemn-eyed child. "Perhaps . . . perhaps we could try shorter hops . . . just across the cave . . . till I get the feel of it."

"Nonsense!" White boomed abruptly. "Remember your own theory. Physical space is not an entity. That balcony on Wing IV, outside the door to old Sledge's shop, is just as near, paraphysically, as this bench. And we've no time to waste."

He nodded impatiently at the long grid sections, and the blue hate in his eyes was an unquenched flame.

"Your theory ought to help you, Claypool. I believe, myself, that physical space is merely a convenient sensory illusion. But all you really need to do is relax. Dawn can carry you to Wing IV—if

you'll just let go your unconscious opposition."

And the child turned to him, holding up a small grubby hand. She looked very tiny, but she had found a new and brighter scarlet ribbon for her hair. Her eyes were huge and dark and shining eagerly.

"Come on," she said. "Let's go."

And suddenly he knew the way. He caught the spark of her courage, and gave her his trust. She led him, and they didn't even have to step across a line. They didn't seem to move at all, but they were on the balcony.

"See!" she told him softly. "It wasn't hard at all."

She stood beside him, still clutching his hand. He squeezed her warm tiny fingers, with a voiceless gratitude for her presence, and then looked about him dazedly.

The narrow metal floor of the balcony jutted from a gray wall, which gleamed with the dull color of oxidized aluminum. That wall reached, windowless, far to right and left. It soared above them, topless. It dropped beneath, a blank metal precipice, so far that his breath went out when he tried to look down.

His searching eyes found a narrow door behind them, and his anxious mind could see a tattered drawing, printed fast in his memory now. That door would let them through Sledge's old shop. Just beyond the shop were the three grid sections that held the Prime Directive, and then the two that must be changed.

He let his gaze drift up again, and again the vastness of the building stunned him. But the relay grid must have been growing like a living brain, he knew, ever since old Sledge first energized it. The humanoids must have built additional sections for it, every time their teeming trillions reached another planet.

The old ground level must have been near this balcony, and Sledge's shop must once have been some rough temporary building—for he had been alone here at first, working desperately amid the deadly rubble of rhodomagnetic war, building his machines to banish war forever.

But eighty years had changed Wing IV.

Claypool looked beyond the low gray railing, and felt a shiver of awe. The shadow of this tremendous solitary tower fell dim and vast before him, an endless blot that lay out across a strangely leveled plain. For the whole planet, out to the gray rim of a murky sky, seemed to be one single spaceport.

Interstellar craft were arriving and departing. All those mighty vessels must have been as enormous as the black ships which brought the teeming machines to his own world, yet those in the far distance seemed tiny as midges flying. They were numberless, multitudinous as dark insects swarming.

A few landed on the surface, near enough for him to glimpse dark rivers of ore roaring out of them—metal, he thought, for new machines. One ship was loading. He saw ordered armies of tiny black me-

chanicals marching up its gangways —ready, he supposed, to quiet all the quarrels of some troubled world with the crushing benevolence of the Prime Directive.

Most of those great craft, however, dropped through black pits toward the planet's bowels. For all Wing IV, he saw, must have become a single labyrinth of entrance shafts and landing cradles, ore bins and smelters, foundries and factories—the dark metal matrix of this unimaginable machine, where the humanoids were born.

He withdrew from the railing, humbled and shuddering.

Dawn crouched against him, and they crept back against the cold face of the metal wall. She had been proudly brave, showing him the way, but now her small hand clung hard to his. He drew her toward the narrow door.

"No, that wasn't very hard." He gave her a pale smile. "Now yet's find those two grid sections, and put the new ones in."

But she hung back.

"Wait!" she whispered urgently. "'Cause Mr. White says you ought to look at that." She pointed, out across that gray, busy vastness. "He says maybe you can tell him what it is."

He looked the way she pointed, and saw the thing the humanoids were building. It was dome-shaped, taller than its breadth, colored darkly red. Dim in the smoky distance, a web of black scaffolding still surrounded it.

It towered up, far-off and alone. At first he had no clue to its size, and then he saw a descending interstellar vessel, creeping down across the dark scarlet face of it, a thin black fleck. He knew then that it was enormous.

"Mr. White wants to know what you think it is?" Dawn was whispering urgently. "He says maybe you can guess, 'cause you're a rhodomagnetic engineer. He says you ought to try, 'cause he's afraid of it. Even Mr. Overstreet can't see inside it any more, but he thinks it's nearly done."

Claypool peered at the far curve of it. Were the humanoids attempting to improve themselves, with that vast new grid of platinum relays? That seemed scarcely possible—they were already much too perfect.

A thin wind brushed Claypool's face. It stung his eyes with a bitterness of furnace smoke and industrial fumes. It was the stifling breath of the machine. He coughed, and shuddered, and turned quickly to the child.

"Tell Mr. White I don't know what that dome could be," he whispered. "Platinum relays couldn't be rhodomagnetic, and I don't know any use for them." He was afraid to guess, and he moved impatiently toward that narrow door. "Now I think we ought to get started."

"Yes, Mr. White says we ought to hurry," she agreed. "'Cause Mr. Overstreet can see trouble waiting for us. Only he can't see just what it is, 'cause *that* gets in the way."

She nodded fearfully toward that far scarlet dome, and then they

turned hastily to the narrow door. Oddly, in this world without men, it had a knob to fit a human hand. It opened stiffly. A short hallway, the walls of it glowing faintly with a gray radiant paint, let them into a room older than the humanoids.

Into old Sledge's shop.

"Wait!" Dawn breathed again. "'Cause Mr. Overstreet is watching the sections we must change, and he says one of the black things is too near it now. We must wait in here till it goes away."

Waiting uneasily, Claypool looked wonderingly around this room where old Sledge had made his dark machines, too well. The dull cold radiance of the paint fell on a scarred wooden desk and a worn swivel chair, on a dusty drafting table with a tall stool pushed against it, on long shelves of technical books in faded bindings, on cluttered benches and rusting tools. The place had a dry stale odor, of years and slow decay.

In one corner, a few moldering blankets were still folded neatly on a cot, and a little table was stacked with dishes and rusted cans and beakers and an alcohol burner—as if old Sledge had interrupted his strange creation only reluctantly, to snatch the simplest essentials of life.

Beyond the shop was an inner door. They waited before it, and the child's cold hand was tight in his own. Gay with the ribbon, her head was bent as if to listen. His mind rehearsed the things they had to do, and he whispered:

"We must find those two sections —number four and number five. I'll undo the connections. You take them to the cave, and bring back the new ones. I'll hook them in—and you must stop any humanoid that finds us."

Dawn nodded, listening.

That was all they had to do. It would take them five minutes more, with any luck at all—to amend the Prime Directive with a bill of human rights, and free many thousand worlds from a suffocating kindness. His heart thumped loud, and the leg the humanoids had set began to tremble weakly.

Dawn suddenly tightened her icy fingers on his hand, and pointed at the door. It also had a common knob, to fit a human hand, instead of a concealed relay. He opened it —and closed it quickly.

Beyond, he had seen Humanoid Central.

The relays of the mechanical brain were arranged in panels, and each panel was packed with intricate sections like the two he had built. He could see no cables—all its rivers of energy must be carried on rhodomagnetic beams. The vastness of it rocked him.

The humanoids required no light, and most of that enormous space within the tower was quite dark. But on this original level, which Sledge himself had built, the panel faces and the narrow inspection walks before them were finished with a gray-glowing paint. That dim light shone far into the gloom, above and beyond and below.

The panels of the grid made end-

less shadowy avenues. Level on level, they reached above as far as he could see, and they fell away, level under level, down into the chasm of the dark. Busy on the web of narrow walks, he had glimpsed scores of humanoids.

All those black machines were hurrying along with a quick efficient grace, some of them carrying tools —busy, he supposed, enlarging and maintaining the grid. But that glimpse of them had shaken him. He leaned weakly against the closed door. The child clung hard to his hand, peering up at him with a mute alarm.

"I'm sorry," he whispered. "I just forgot they're blind."

And he opened the door again.

They crept out silently, into the Central. Beneath a soundless hush, Claypool fancied that he could sense the pulsation of unimaginable energies—the power beams that controlled and drove trillions of black machines, on many thousand worlds.

They pushed out breathlessly, along a dimly glowing walk. That narrow footway had no railing—it was built for perfect machines, that never slipped or erred. He leaned shuddering back from the gulf of bottomless dark.

Trying not to look at the busy little machines, hurrying about that endless web of metal ways, he searched the panel faces. And he found the numbers that old Sledge had painted on the sections, eighty years ago. Hasty brush marks, splashed on for identification in the shop, they were faded now, and peeling away from the satiny palladium shieldings.

They were faint with age, but he could read them still. The first three sections held the Prime Directive. Three long, silvergray cases, a little smaller than three coffins. The freedom and the future of mankind had lain buried in them for eighty years, he thought, murdered by error to preserve a sterile peace.

He crept out along that giddy way. White and silent, the child clung hard to his arm. He tried to ignore the blind machines ahead, and blinked to read the peeling numbers.

Four!

For an instant he couldn't breathe. He felt as if that narrow walk had swayed beneath him, and he clutched desperately for the panel edge. But Dawn tugged sharply at his hand, pointing fearfully at a dark intent machine that was moving too near. He fumbled in his pocket for the pliers he had brought, and lifted the cover of the fourth section.

"Oh—"

Dawn's cry was a low moan of pain. She let go his fingers. At first he didn't know what had happened. He thought that a mechanical had found them, and then he was afraid she had fallen from the walk. The pliers made an alarming clatter on the thin shielding. He nearly lost his own balance, and skinned his knuckles in his frantic snatch for safety.

Then he found her.

She had backed away from him, along that dizzy walk. She stood

frozen, like a mechanical at rest. Her pinched face was bloodless. Her staring eyes seemed enormous in the gloom. Voiceless, she was pointing stiffly at the door behind them.

Claypool looked at that door. It was still closed. He could hear nothing, in that hush of silent power. He glanced fearfully at the nearest black machine again. It still ignored them, brushing invisible dust from a dimly glowing panel.

The door opened, behind him.

He heard the creak of it, and panic spun him. He saw a man, striding confidently out along that giddy path. For an instant he felt a weak relief, because it wasn't a machine. Then stark dismay clutched him back again, for he recognized Frank Ironsmith.

"Stop it, Claypool!"

Ironsmith's pleasant voice rang clear and imperative, alarming in those dim corridors of the grid. He stalked that narrow way, indifferent to any risk of falling. His boyish, sunburned face looked lean and stern, and his gray eyes held a stricken sadness.

"You blundering fool, Claypool!" Lower now, his voice reflected neither hate nor anger, but only an infinite shocked regret. He came up to them, and his sick, pitying eyes fell to the rigid, staring child.

"Now look what you have done!"

XXII.

For an instant Claypool stood heartsick and shaken, swaying on that narrow footway which was meant for sure machines. Fighting a sudden giddiness, he shrank back from the shadowy chasms of the metal brain. Hushed and unimaginable energies seemed to roar around him, a silent hurricane.

"I tried to warn you, Claypool."

He heard that shocked and saddened reproof, and blinked unbelievingly at Frank Ironsmith—who should have been idling at Starmont, reading his books and playing his chess, riding his cycle and chewing his gum and playing around with his math.

But this startling intruder was changed, somehow, from that lank and callow youth in the computing section, brilliant and indolent, amusing himself with new geometries instead of crossword puzzles. Youthful still, he looked leaner and finer and browner, older and sobered.

"Because we can't allow—"

He was interrupted, by Claypool's savage lunge.

For a desperate resolution had overcome Claypool's dizzy sickness. Another five minutes, he knew, would be enough to change the relay sections, to amend the Prime Directive and set men free. He didn't intend to be stopped.

He stood empty handed, for he had brought no weapon. Even the heavy pliers had been dropped, in his first alarm. But sudden purpose clenched his fist, and sudden fury drove his lashing blow.

Darting forward, he forgot all his fear of the black spaces of the brain beneath that narrow path, all his dread of the blind machines behind

him. He remembered only the way Ironsmith had always liked the humanoids, and the unfair freedom he had won, and his treacherous hunt for White.

But Ironsmith evaded that slashing blow. Smiling sadly, he caught Claypool's quivering wrist. Quick and strong as any humanoid, he twisted it up and back. Claypool was pinned back against the gray panel faces. He gasped and pulled and tried to strike again, and somehow hurt his injured knee.

Throbbing pain checked his fury.

"That's no use, Claypool." Ironsmith's low calm voice held no resentment, but only a gentle regret. "You can only hurt yourself. Because you didn't let the humanoids complete their treatment of your leg, and you aren't fit to fight. You may as well give up."

Not yet! Claypool shook his head to clear a dull mist of pain. He twisted in Ironsmith's hard grasp, to ease his arm, and shifted his weight to relieve his throbbing knee. He looked desperately behind him on that perilous walk, and found Dawn Hall. She stood white and stiff with fright, but he knew the power in her.

He fought his pain, and got his breath.

"Dawn!" he whispered desperately. "Stop him!"

Ironsmith twisted back his arm again, with the deft and ruthless skill of a machine. He had to flinch, and too much weight came on his shuddering knee. But red surging hatred overcame the pain. Chilled with sudden sweat, he gulped for breath and whispered frantically:

"Stop him, Dawn—like you stopped those machines! Mr. White can show you how. I know you can do it—because he has got potassium in his blood."

Cold waves of agony beat him back against the glowing panels of the grid, but still he whispered faintly:

"Kill him, Dawn! You must—so we can set men free!" He twisted in a tight sheath of pain, and stared through a clotting mist of pain at the child's fear-distended eyes. "Just find the K-40," he implored her. "Break the atoms in his blood—Mr. White can show you how!"

But the little girl shook her head, with a stiff, tiny movement. Her thin face was drained white, and her great staring eyes didn't seem to see him. Her blue lips moved, as if she tried to whisper. But Claypool heard no sound.

And nothing happened to Ironsmith.

Dazed from the shock of that failure, Claypool gave way to his pain. He stopped his useless struggles, and Ironsmith mercifully loosened his arm. His throbbing knee yielded suddenly, and he staggered on that unrailed footway, snatching frantically at nothing, until Ironsmith reached out to help him get his balance. He clung to the smooth palladium panels, sobbing weakly for his breath, chilled and pimpled with his pain.

Dawn shuddered behind him, and spoke:

"At your service, Dr. Claypool."

He shuddered back from her, numbed and stricken. For now her thin treble voice had a new quality of whining, emotionless melody. It was like the voices of the humanoids.

"We heard your unwise request, but we cannot injure Mr. Ironsmith," she said, "because he has kept the Compact. He has defended our relays, from your own unhappy effort to alter the Prime Directive. You are the one who must be restrained, sir."

That strange voice stopped, and the child stood motionless as a mechanical not working. Claypool couldn't even see the stir of her breathing. Distended and dark in her bloodless face, her eyes seemed blank and blind as the steel-colored eyes of the humanoids.

Even her human fear was gone.

For a slow smile was coming over her tiny face—a white, dreamy smile, that he was sick to see. It held no human hope or joy or life. It reflected the serene benevolence of the humanoids. It was mechanical.

Claypool turned shakenly away from her. His stomach felt cold and queasy, and he was sick with dread of something darker than the cavernous spaces of the unlit grid. He blinked at Ironsmith's stern regretful face, and croaked his accusation:

"What have you done to her?"

"Not I." Sadly, Ironsmith shook his bare sandy head. "It's a dreadful thing, I know." His cool gray eyes rested on the strange, frozen figure of the little girl, and Claypool saw the shocked pity in them. "Unless we're very lucky, the humanoids will be forced to act too drastically, to preserve the Prime Directive.

"But you're the one to blame."

"I?" Claypool winced angrily. "How?"

"Come along." Ironsmith looked at the child again, and sorrowfully shook his head. "We can't stay here in the Central."

And he turned his back, as if in sublime contempt of all Claypool's attacks. He went striding back along the narrow inspection walk, sure and quick as any mechanical, toward the small metal door where they had entered. Claypool crept after him meekly, limping on his swelling knee, swaying to another wave of vertigo.

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